



# COMMERCIAL FISHERIES ABSTRACTS

UNITED STATES DEPARTMENT OF THE INTERIOR  
U.S. FISH AND WILDLIFE SERVICE  
BUREAU OF COMMERCIAL FISHERIES







# UNITED STATES DEPARTMENT OF THE INTERIOR

## U.S. FISH AND WILDLIFE SERVICE

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<div data-bbox="130 1261 154 2102" data-label="Section-Header"> <p>0.5 HEAT RESISTANCE OF <u>SALMONELLA</u> IN VARIOUS EGG PRODUCTS</p> </div> <div data-bbox="169 1142 269 2102" data-label="Text"> <p>Caribaldi, J. A., R. P. Straka, and K. Ijichi (Western Regional Research Laboratory, Agricultural Research Service, U.S. Department of Agriculture, Albany, California 94710) Applied Microbiology <u>17</u>, No. 4, 491-496 (April 1969)</p> </div> <div data-bbox="284 1142 454 2102" data-label="Text"> <p>The heat resistance at various temperatures of a standard reference strain of <i>Salmonella</i> (S. Typhimurium Tm-1) in the stationary phase of growth was determined in various egg products produced by the industry. Such data are needed for preparing guidelines for the heat treatments necessary to product commercially acceptable salmonella-free egg products. The time required (D value) to kill 90 percent of the salmonella population at a given temperature in a specific egg product was as follows:</p> </div> <div data-bbox="654 1617 685 1692" data-label="Text"> <p>(over)</p> </div> <div data-bbox="700 1595 746 2134" data-label="Page-Footer"> <p>COMMERCIAL FISHERIES ABSTRACTS VOL 22 NO 9 PAGE 1 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</p> </div> <div data-bbox="716 1228 746 1541" data-label="Text"> <p>Abstracter: F. T. Piskur</p> </div>	<div data-bbox="107 258 154 1034" data-label="Section-Header"> <p>1.30 MODELS OF OCEANIC MIGRATIONS OF PACIFIC SALMON AND COMMENTS ON GUIDANCE MECHANISMS</p> </div> <div data-bbox="161 64 269 1034" data-label="Text"> <p>Royce, William F., Lynwood S. Smith, and Allan C. Hartt (Fisheries Research Institute, College of Fisheries, University of Washington, Seattle 98105) U.S. Fish and Wildlife Service, Fishery Bulletin <u>66</u>, No. 3, 441-462 (September 1968)</p> </div> <div data-bbox="269 21 700 1034" data-label="Text"> <p>The general oceanic distribution and migratory behavior of Pacific salmon are summarized, and a model of the entire migration is developed for each of three typical stocks. The pink salmon of southeastern Alaska and British Columbia circle the Gulf of Alaska counterclockwise within an area generally bounded on the west by long. 155° W. and on the south by lat. 41° N. They travel generally "downstream" in the Alaskan Gyre and the associated currents. The pink salmon of the Karaginski district on East Kamchatka also apparently make a counterclockwise circuit of the Bering Sea and North Pacific Ocean in an area bounded approximately on the west by long. 155° E., on the south by lat. 40° N., on the east by long. 150° W., and on the north by lat. 60° N. Their migratory circuit is generally "downstream": southward in the East Kamchatka Current, eastward in the Subarctic Current, and finally westward and northward in the Alaskan Stream and the Bering Sea Gyre. The sockeye salmon of Bristol Bay make two or three counterclockwise circuits in the Bering Sea and North Pacific Ocean within an area bounded approximately on the north by lat. 60° N., on the west by long. 165° E., on the south by lat. 45° N., and on the east by long. 140° W. The number of circuits depends upon the number of winters spent by the salmon at sea. In general, they travel "downstream" in the major current systems within the area (over)</p> </div> <div data-bbox="700 517 746 1078" data-label="Page-Footer"> <p>COMMERCIAL FISHERIES ABSTRACTS VOL 22 NO 9 PAGE 1 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</p> </div> <div data-bbox="716 237 746 463" data-label="Text"> <p>Authors' abstract</p> </div>
<div data-bbox="777 1239 800 2102" data-label="Section-Header"> <p>0.6 MICROBIOLOGICAL PROTEIN -- AS A FOOD AND FEED INGREDIENT</p> </div> <div data-bbox="823 1142 900 2102" data-label="Text"> <p>Shacklady, C. A. (Research and Development Department, The British Petroleum Company Ltd., London, England) Food Manufacture <u>44</u>, No. 4, 36-37, 40 (April 1969)</p> </div> <div data-bbox="900 1142 993 2102" data-label="Text"> <p>Microbiological proteins include bacterial proteins, fungal proteins, and yeast proteins. This article deals with yeast protein, since the author's company (BP) has done most of its work in that field and since, as far as the author can tell, it is the field nearest to commercial realization.</p> </div> <div data-bbox="993 1142 1270 2102" data-label="Text"> <p>The work done by BP in developing its processes for production of yeast on hydrocarbon substrates has been directed primarily toward growing a product that can be used in animal feeds rather than in human food. The processes for producing the yeast are essentially fermentations in which conventional carbohydrate substrates are replaced by hydrocarbon fractions, either heavy gas oil or pure normal paraffins. Yeast grown on normal paraffins has a crude protein content of 63 percent and a fat content of from 8 to 10 percent; yeast grown on gas oil has a crude protein content of 67 percent and a fat content of from 1 to 2 percent. The low fat content of the latter yeast is the result of removing the unmetabolized gas oil from the yeast by solvent extraction; thus a large part of the natural lipids is removed. Solvent extraction is not necessary for yeasts grown on normal paraffins. The amino-acid composition of the two yeast proteins is almost identical.</p> </div> <div data-bbox="1270 1142 1316 2102" data-label="Text"> <p>The essential amino-acid patterns of hydrocarbon-grown yeast, of fish meal, and of soybean meal are distinctly similar except for the lower content of (over)</p> </div> <div data-bbox="1332 1595 1378 2134" data-label="Page-Footer"> <p>COMMERCIAL FISHERIES ABSTRACTS VOL 22 NO 9 PAGE 1 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</p> </div> <div data-bbox="1355 1261 1386 1541" data-label="Text"> <p>Abstracter: L. Baldwin</p> </div>	<div data-bbox="777 980 800 1034" data-label="Section-Header"> <p>2.02</p> </div> <div data-bbox="777 86 908 1034" data-label="Text"> <p>POSTMORTEM DEGRADATION OF GLYCOGEN AND STARCH IN FISH MUSCLE Tarr, H. L. A. (Fisheries Research Board of Canada, Vancouver Laboratory, Vancouver, British Columbia) Journal of the Fisheries Research Board of Canada <u>25</u>, No. 8, 1539-1554 (August 1968)</p> </div> <div data-bbox="916 64 1193 1034" data-label="Text"> <p>Recently various workers have demonstrated the presence of glucose in post-mortem fish muscle. Apparently, glycogen is degraded in fish muscle postmortem by hydrolytic (amylolytic) and phosphorolytic (Embden-Myerhof) pathways. Rather limited studies have been carried out on autolyzed and homogenized muscle to determine the comparative importance of these pathways. The present authors investigated the degradation of glycogen and starch in small blocks of fish muscle in order to simulate the conditions of storage of postmortem natural fish. The degradation of glycogen and starch in excised blocks of the muscle of fish stored at 0°-5° C. postmortem was studied by the use of radioactive substrates. The various metabolites in the stored muscles were separated by perchloric acid extraction, gel filtration, treatment with anion and cation exchange resins followed by appropriate elution methods, and paper chromatography.</p> </div> <div data-bbox="1193 64 1332 1034" data-label="Text"> <p>The results demonstrated that glycogen is degraded by both hydrolytic and phosphorolytic pathways, and that starch is similarly degraded but more slowly. Brief blending of the muscle did not significantly alter the degradative pattern. Lactate and glucose usually predominated; however, dextrans (or nondegraded substrate), maltose glucose 6-phosphate, hexose diphosphate, ribose 5-phosphate, and (over)</p> </div> <div data-bbox="1339 517 1386 1078" data-label="Page-Footer"> <p>COMMERCIAL FISHERIES ABSTRACTS VOL 22 NO 9 PAGE 1 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</p> </div> <div data-bbox="1362 161 1393 474" data-label="Text"> <p>Abstracter: F. T. Piskur</p> </div>







INCIDENCE OF CLOSTRIDIUM BOTULINUM TYPE E  
IN COMMERCIALLY AND LABORATORY DRESSED WHITEFISH CHUBS

Fantasia Leonard D., and Anthony P. Duran (Food and Drug Administration, U.S. Department of Health, Education, and Welfare, 850 Third Avenue, Brooklyn, New York 11232)  
Food Technology 23, No. 6, 85-86 (June 1969)

The purpose of this study was to determine whether proper dressing and handling of raw nonvisceralized fresh-water fish according to the guidelines of the U.S. Public Health Service would significantly decrease the incidence of Clostridium botulinum Type E contamination. The test sample consisted of 500 commercially dressed raw chubs and 500 whole chubs taken from one catch. The fish were caught by gill net near the Two Rivers, Wisconsin, area of Lake Michigan. The 500 whole fish were taken to the laboratory and examined, and those that were bruised or damaged were discarded, leaving 427 whole chubs. The fish were eviscerated and washed, then frozen and packaged. A comparison was made of the frequency of contamination by Cl. botulinum Type E of the chubs processed commercially and those processed in the laboratory.

Cl. botulinum was found in 6.2 percent of the commercially dressed raw chubs (31 of 500 fish) and in 0.4 percent of the laboratory-dressed chubs (2 of 427) (over)

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Abstracter: F. T. Piskur

INFORME SOBRE EXPERIMENTOS DE SELECTIVIDAD DE MERLUZA  
CON RED DE ARRASTRE  
[REPORT OF EXPERIMENTS ON THE SELECTIVITY FOR HAKE  
OF TRAWLS]

Saetersdal, Gunnar, and Luis Villegas  
BoIn Inst. Fom. pesq. Santiago, Boletin Cientifico No. 9, 16 pp. (1968) (In Spanish; English summary)

In the trawl fishery, the size of the nets' meshes are most important in a regulated fishery. This report presents the results of a continuing study of the selectivity of various-sized meshes for hake (Chilean merluza). The selectivity factor, which describes the capacity of the net to hold the fish, is the major criterion in this report. It is calculated by dividing half the length of the net (measured in centimeters) by the size of the mesh (measured in millimeters). The selection factors for different types of trawls and trawl cod-ends were obtained. A net with a cod-end made of single-plaited polyester twine and having a mesh size of 96-97 mm. had selection factors of from 3.8 to 4.1, with an average of 4.03. A single haul with a net having a cod-end of double polyethylene twine and mesh size of 68 mm. gave a selection factor of 4.0. Escapement from a commercial hake trawl having 70-mm. meshes and a protective net covering the upper side of the cod-end was less than from a shrimp trawl having a mesh size of 37 mm. A comparison of these data with selection data obtained for other hake species during European experiments gave similar results; however, selection factors for *M. [Merluccius] bilinearis* caught off the east coast of the United States (over)

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Abstracter: L. Baldwin

## TESTS AT PLYMOUTH OF CABLE-LESS NET SOUNDER

Holme, N. A., and R. C. Mills (Plymouth Marine Laboratory [England])  
World Fishing 18, No. 3, 40-42 (March 1969)

When a midwater trawl is being fished, the depth at which it is fishing must be known so that the depth can be regulated relative to the fish displayed on the echo-sounder recorder. A Netzsonde, which consists of a transducer mounted on the headrope and linked by cable to the ship's recorder, is customarily used for the purpose in Europe. The electric cable required for this type of net sounder must have high tensile strength to minimize breaking; as a result, it is expensive--a 500-fathom cable may cost over £600. Moreover, a special winch with its attendant space and manpower requirements must be available to handle the cable.

Now a Japanese company has introduced a transducer-type net-depth recorder that does not require a cable to link it with the ship. One of the net sounders, the Furuno FNR-2, was attached to the headline of a small Boris midwater trawl equipped with Suberkrub doors and tested in moderate seas in the English Channel at depths ranging from 27 to 59 fathoms.

The FNR-2 consists of a transmitter powered by eight 1.5-volt manganese batteries and a towed, airplane-shaped, fiberglass body containing a hydrophone that is linked by cable to the recording unit. The transmitter is enclosed in a cylindrical steel case that is clamped to a backboard, which, in turn, is attached to the net in such a way that the transducer points toward the seabed while the retransmitting unit faces toward the ship. The recording unit uses light-gray, (over)

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Abstracter: L. Baldwin

BOTTOM TRAWL EXPLORATIONS IN SOUTHERN LAKE MICHIGAN,  
1962-65

Reigle, Norman J., Jr. (Exploratory Fishing and Gear Research Base, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Ann Arbor, Michigan 48103)  
U.S. Fish and Wildlife Service, Circular 301, 35 pp. (February 1969)

For 4 years the Bureau of Commercial Fisheries Exploratory Fishing and Gear Research Base at Ann Arbor, Mich., surveyed the abundance, seasonal availability, and depth distribution of various fish stocks.

The alewife (*Alosa pseudoharengus*) and chubs (*Leucichthys* spp.) were taken readily with the bottom trawl. Alewives composed 51.4 percent and chubs 44.0 percent of the trawl catch. Two other commercial species, yellow perch (*Perca flavescens*) and smelt (*Osmerus mordax*), were taken occasionally in commercial amounts.

The alewife stocks have increased tremendously in recent years. The poundage of alewives in the trawl catch increased each year from 17 percent in 1962 to 74 percent in 1965. Alewives exhibited pronounced seasonal movements and generally were available to bottom trawls only at specific depths. The trawls caught alewives at depths of less than 5 fathoms to over 50 fathoms. Alewives appeared to be distributed universally in the study area during most of the year but were found only in some sections in winter. Alewives were more difficult to catch between July and the end of December than during January through June.

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Author's abstract



2.112 (Cross Reference: 1.0118)

Chubs were abundant all year throughout southern Lake Michigan. Chubs were caught over a wide depth range throughout the year, although bottom trawling indicated some horizontal dispersal shoreward in summer and back to deeper water in fall. [6 figures, 25 tables, 8 references] [Author's abstract]

2.11121 (Cross Reference: 1.153)

are appreciably lower. Because Chilean fishermen use cod-ends made of double twine, which generally allow less escapement of fish than do the single-twine nets used in most of these experiments, the authors recommend a selection factor of 3.8 for the Chilean fishery. [6 figures, 2 tables, 2 references]

#### 2.115 OUTSIDE BALLAST MAY DAMPEN TROLLER'S ROLL

Stewart, Dave  
Western Fisheries 78, No. 2, 90-93 (May 1969)

The keel of a West Coast troller has been fitted with 1,000 lb. of steel and concrete block to slow down her excessive roll. The unusual ballast was bolted to the bottom and then given a coat of copper paint. The article also discusses the causes and solution of engine noise, pits in the cooling pipes, pockmarked planking, and electrical interference. [Abstracter: L. Baldwin]

911'2

dry, electro-sensitive paper 8 in. wide. It has a scale width of 6.75 in. representing fathoms. The plot is straight line; paper speeds may be fast or slow; and the stylus is synchronized with the transmitter by a powerful synchronization pulse that appears just before the transmission line of the echo-sounding pulse. An ordinary oscilloscope can be connected to the net-sounder unit. During the trials, a conventional cable-linked transducer was mounted side by side with the FNR-2. Both transducers permitted accurate depth monitoring. The FNR-2 trace, though more compressed than that of the conventional unit, was adequate for controlling depth. For critical measurements like those for net gape, however, a scale expander would give the better readings, the testers point out. Detection of fish shoals by the FNR-2 was adequate, though fish echoes, particularly those below the net, showed up more clearly in the conventional transducer trace. Traces of fish actually within the net mouth showed up better on the FNR-2 recorder.

The author suggests that a choice between the two systems depends on the reliability of the FNR-2--the tests reported here were not exhaustive enough to permit a definitive conclusion about that. Costs of the units seem to be relatively equal. The FNR-2, with spare transmitter and installation charges, costs something over £2,000. The conventional headline transducer, with cable and special winch, costs about £1,500; however, the price of replacing the extremely vulnerable cable could equalize the two prices. [4 figures]

0.5

#### EFFECT OF TEMPERATURE ON GROWTH OF SALMONELLA IN REHYDRATED SKIM MILK FROM A FOOD-POISONING OUTBREAK

Julseth, R. M., and R. H. Delbel (Food Research Institute and Department of Bacteriology, The University of Wisconsin, Madison 53706)  
Applied Microbiology 17, No. 5, 767-768 (May 1969)

Most-probable-number determinations for *Salmonella* indicated nine organisms per 100 grams of a sample of dried skim milk that was implicated in an outbreak of salmonellosis. The organisms grew rapidly in the reconstituted milk incubated at 30° and 37° C. The authors suggest that relatively small numbers of salmonellae contaminating a food product to be consumed without heat treatment at the consumer level can be of public health significance. [Abstracter: F. T. Plakur]

#### 2.1127 FISH BAITS

U.S. Patent 3,421,899  
Humphreys, R. E. (pat.)  
Angler Products, Inc.  
Food Technology 23, No. 6, 62 (June 1969)

Fish bait is formed from a homogeneous protein gel. The gel contains a hardening and toughening agent so that the formed bait will be retained on the fish hook. It slowly releases soluble fish-attracting substances in the water.

50'2



# IRRADIATION OF PACIFIC COAST FISH AND SHELLFISH. 7--STORAGE LIFE AT 33° F. OF IRRADIATED AND REPACKED MEAT OF DUNGENESS CRAB

Teeny, F. M., D. Miyauchi, and G. Pelroy (Technological Laboratory, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, 2725 Montlake Boulevard East, Seattle, Washington 98102)  
Fishery Industrial Research 5, No. 1, 17-24 (May 1969)

Fresh Dungeness crab meat, owing to its relatively short and variable storage life, is ordinarily restricted to sale close to its area of production. The object of this study was to determine the storage characteristics of radiation-treated fresh crab meat. The ultimate purpose is to develop a method of preserving fresh crab meat so that the product can be marketed in regions distant from the area of production.

Fresh Dungeness crab meat packed in wholesale-sized (No. 10 can) containers was irradiated then stored for 12 or 20 days at 33° F. Subsequently, the crab meat was repacked in retail-sized containers (small paperboard trays with cellophane overwrap) and again stored at 33° F.

After an initial storage period of 12 days in the No. 10 cans, the samples of crab meat irradiated at 100 and 200 kilorads had, after being repacked, an additional shelf life of at least 6 or 7 days, respectively. For the crab meat held for 20 days in the No. 10 cans, the samples irradiated at 100 and 200 kilorads had, after being repacked, an additional shelf life of at least 2 or 5 days, (over)

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Abstracter: F. T. Piskur

# CARTERET COUNTY SEAFOOD PROCESSING PROJECT

Report prepared by Marine Chemurgics, Inc. (Contractor), Morehead City, North Carolina)  
Carteret County Seafood Processing Project. Part I (March 1966); Part II (February 1968); Part III (April 1969). Contract No. C-194-66. Project No. C3-6-09022 (Available from the Office of Publications, Economic Development Administration, U.S. Department of Commerce, Washington, D.C. 20230)

The seafood fishery of Carteret County, North Carolina, provides a substantial part of the State's total landings. Although it is a mainstay of the local economy, it is inadequate to absorb the available work force. To alleviate the underemployment, the Economic Development Administration, U.S. Department of Commerce, contracted for a survey of the fishery--the potential for seafood processing and the steps local firms could take toward realizing that potential.

In March 1966, the contractor submitted his first report. The potential is there. A seafood-processing industry would have strategic access to the fishing harvest both by land and by water. Not only are the resources adequate, but so are boats and facilities that can be adapted to processing. Moreover, a ready, established market is near at hand. Thus dealers and wholesalers with buildings, refrigeration facilities, trucks, and a part-time work force were encouraged to set up compact, sanitary processing rooms on their premises. A prototype plant was used to demonstrate plate- and blast-freezing techniques, packing and

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Abstracter: D. R. Alexander

# COMPUTER OPTIMIZATION OF NUTRIENT RETENTION IN THE THERMAL PROCESSING OF CONDUCTION-HEATED FOODS

Teixeira, Arthur A., John R. Dixon, John W. Zahradnik, and George E. Zinsmeister (Department of Agricultural Engineering and Department of Mechanical and Aerospace Engineering, University of Massachusetts, Amherst 01003)  
Food Technology 23, No. 6, 137-142 (June 1969)

In the conventional method for the thermal processing of canned foods, the process times are calculated on the basis of achieving sufficient bacterial lethality in each container to comply with certain prescribed standards. Associated degradation of nutrients and quality factors accompanies each thermal process. It has been shown that in certain foods (strained baby foods) optimum nutrition retention favors short process times at high temperature; however, there is no verification that such a relation holds true for solid-packed products where the temperature distribution is nonuniform. In this paper, the authors present a digital computer program for the determination of bacterial lethality and nutrient retention in conduction-heated foods.

The computer program was developed in three steps: (1) a basic program was set up to integrate the general rate equation using finite volume elements, (2) a temperature distribution program was established to obtain temperature distribution throughout a container for any instant in time using a finite difference technique, and (3) the programs in (1) and (2) were combined into a final program

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Abstracter: F. T. Piskur

# IMPROVED METHOD FOR PRODUCING PINDANG

Ilijas, Sofjan (Institute of Fisheries Technology, Department of Agriculture, Djakarta, Indonesia), and Louis J. Ronsivalli (Technological Laboratory, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Emerson Avenue, Gloucester, Massachusetts 01930)  
Fishery Industrial Research 5, No. 1, 11-16 (May 1969)

Boiled salt fish, or "pindang," is popular in Indonesia and in certain other countries. In the Philippine Islands it is known as "sinaeng" and in Thailand, as "platanung." Pindang is produced as follows: Alternate layers of fish and salt are placed in earthenware or tin containers. The containers are supported inside a covered pot above a layer of boiling water and cooked about 8 hours. At least once during the cooking process, liquid is drained from the containers and then additional salt is sprinkled over the fish. The resulting product will keep about 1 to 12 weeks at room temperature depending upon the concentration of the salt. The process used is primitive and the keeping quality of the product is variable. The purpose of the present study was to improve the processing technique and the keeping quality of pindang by developing a method for processing the product in plastic containers.

Polyethylene-coated polyester pouches were used. Cod fillets were used as the source of fish material. The fish fillets and salt were placed in the plastic pouch, and the container and contents were heated by steam. After the fish had

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Abstracter: F. T. Piskur



been steamed for 2 hours, the drip that had formed was drained off and more salt was added to the pouches. The product was steamed for another 2 hours, and the additional drip that formed was drained off. The pouches were then sealed.

Pindang produced by this method was quite acceptable for up to 3 months of storage at room temperature. In this process, enough salt must be added to insure a concentration in the final product of more than 10 percent. The method using plastic pouches is much more sanitary than the common method using earthenware cooking pots. [1 figure, 10 references]

[Abstracter: F. T. Piskur]

Pheres developed rancidlike flavors when stored at refrigerated temperatures. These flavor changes apparently are caused by the reaction of the fish tissue with the products of the radiolysis of the gaseous phase. Packing the fish under vacuum or in a helium atmosphere then irradiating the packaged product prevented development of off-flavors in the fish during storage. [Abstracter: F. T. Diskur] [2 figures, 7 tables, 16 references]

International Journal of Applied Radiation and Isotopes 20, No. 3, 167-175 (March 1969) (Pergamon Press: London; New York; Paris)

Spinnelli, J. Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Seattle, Washington), A. M. Dollar (College of Fisheries, University of Washington, Seattle), G. A. Wedemeyer (Bureau of Sport Fisheries and Wildlife, U.S. Fish and Wildlife Service, Seattle), and E. C. Gallagher

# IRRADIATION OF FISH FILETS: RELATION OF VAPOR PHASE REACTIONS TO STORAGE QUALITY

3.337

that would determine the number of survivors or the percent vitamin retention associated with any thermal process having a constant retort temperature.

With this computer technique, the lethality and thiamine retention associated with a given thermal process, or the retention of any other nutrient or quality factor that follows a first order, temperature-dependent rate process, can be determined for: (1) various conduction-heated foods, (2) various container sizes, (3) different organisms, and (4) any temperature-time-positive history in the container. Using this technique, the authors were able to find the optimum combination of retort temperature and process time that produced the greatest percent retention of thiamine while maintaining the required bacterial lethality for a given product.

[8 figures, 3 tables, 10 references]

[8 figures, 3 tables, 10 references]

pressure in the chamber.

[Abstracter: F. T. Pliskur]

[Abstracter: F. T. Pliskur]

Société Industrielle et Ind. des Ateliers et Chantiers de Bretagne  
Food Technology 23, No. 5, 52 (May 1969)

STERILIZATION APPARATUS

U.S. Patent 3,418,918

Beauvais, M., and C. Moreau (pat.) Soc. Financière et Ind. de la France.

Food Technology 23, No. 5, 52 (May 1969)

containers to be sterilized are introduced into and withdrawn from a self-sealing chamber containing a sterilizing fluid without substantially changing the pressure in the chamber.

[abstract: F. T. Piskur]



<p>4.5 OXIDATION EFFECTS IN A FREEZE-DRIED GELATIN-METHYL LINOLEATE SYSTEM</p> <p>Zirlin, A., and M. Karel (Department of Nutrition and Food Science, Massachusetts Institute of Technology, Cambridge, Massachusetts 02139) Journal of Food Science 34, No. 2, 160-164 (March-April 1969)</p> <p>Oxidation of the lipids of freeze-dehydrated foods during storage limits the shelf-life of certain food products. Autoxidized lipids in dehydrated foods cause damage such as off-flavors, off-odors, and adverse changes in texture and rehydratability. The changes in texture and rehydratability seem to indicate that the lipid oxidation products interact with proteins during the processing and storage of dried food. Serious problems of lipid oxidation have developed in storage of dehydrated food, but only limited information is available in this field. The purpose of the present research was to elucidate the mechanisms of the oxidative changes by the study of a model freeze-dried protein-lipid system. The model system consisted of methyl linoleate and gelatin. It was incubated in air at 50° C. for up to 10 days in the dry state or at controlled relative humidities.</p> <p>Incubation of the model system from 5 to 10 days caused a drop in the viscosity of the gelatin solutions, an increase in the retention time of gelatin on a Sephadex G-150 column, and a reduction in the melting point of a standard gelatin gel. Such changes in viscosity and solubility properties of the gelatin (over)</p> <p>COMMERCIAL FISHERIES ABSTRACTS VOL 22 NO 9 PAGE 7 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</p> <p>Abstracter: F. T. Piskur</p>	<p>6.131 AIR RECIRCULATION AND INDIRECT CONDENSERS APPLIED TO FISH MEAL DRYERS</p> <p>Merritt, J. H., and J. Graham (Torry Research Station, Aberdeen, Scotland) Fishing News International 8, No. 5, 43-46, 49 (May 1969)</p> <p>During the manufacture of fish meal, air and water vapors containing odorous substances are discharged from the dryer into the atmosphere. Although a number of devices have been used and various measures have been taken to alleviate the problem, the odorous discharge has not been completely eliminated. Moreover, the most common odor-reducing device used, the scrubber/condenser, requires vast quantities of water, which are discharged in a polluted form. This article describes a system that largely solves both the air- and the water-pollution problem created by fishmeal-drying plants.</p> <p>The dryer, the greatest potential source of odorous vapors, had five horizontal cylinders, each with a steam-heated jacket and rotor shaft. Air from the indirect condenser was passed through an eliminator (a steel vessel with a metal screen that was so arranged as to reduce the velocity of the air and cause it to change direction sharply before returning to the dryer) to remove any carry-over moisture. Except for the changes in ducting that permitted recirculation of air, the only major change in the dryer installation was the sealing applied. A special air lock made from an ordinary screw conveyor with a section removed to allow a plug of dried fish material to form a seal was installed where the dried (over)</p> <p>COMMERCIAL FISHERIES ABSTRACTS VOL 22 NO 9 PAGE 7 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</p> <p>Abstracter: L. Baldwin</p>
<p>4.9 EFFECT OF FEEDING AND WITHDRAWAL OF MENHADEN OIL ON THE <math>\omega_3</math> AND <math>\omega_6</math> FATTY ACID CONTENT OF BROILER TISSUES</p> <p>Miller, David, Kam C. Leong, and Preston Smith, Jr. (Technological Laboratory, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, College Park, Maryland 20740) Journal of Food Science 34, No. 2, 136-141 (March-April 1969)</p> <p>Apparently dietary fat can influence the fatty acid composition of tissues. Edwards et al. (1963) and Marion et al. (1963) demonstrated the deposition of long-chain polyunsaturated fatty acids in broilers that were fed diets containing fish oils. Miller et al. (1967) in tests with broilers fed menhaden oil showed that the <math>\omega_3</math> fatty acids deposited in the tissues were correlated with the off-flavor of the broiler flesh. The purposes of the present study were to: (1) Determine the deposition pattern of the <math>\omega_3</math> and <math>\omega_6</math> families of fatty acids in broiler tissues as affected by the ingestion of fish oil contained in a practical broiler diet, (2) the effect of the withdrawal of menhaden fish oil or its replacement by yellow grease at various time periods prior to marketing of the broilers, and (3) the relation of <math>\omega_3</math> and <math>\omega_6</math> fatty acid content in the tissues of the broilers to the organoleptic evaluation of the meat.</p> <p>Broilers were fed corn-soy commercial-type diets containing 2.5 percent and 5.0 percent of fish oil. Two, three, and four weeks before termination of the experiments (the experiment lasted 8 weeks), (1) the addition of oil to the diet was continued, (2) the oil was withdrawn from the diet, or (3) the oil was (over)</p> <p>COMMERCIAL FISHERIES ABSTRACTS VOL 22 NO 9 PAGE 7 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</p> <p>Abstracter: F. T. Piskur</p>	<p>6.199 THE INFLUENCE OF DIETS CONTAINING LOW OR HIGH LEVELS OF FISH MEAL, CASEIN PLUS GELATIN OR MEAT MEAL ON THE SURVIVAL OF CHICKS INFECTED WITH <u>SALMONELLA GALLINARUM</u></p> <p>Hill, R., and I. M. Smith (Royal Veterinary College, University of London, England) Proceedings of the Nutrition Society 28, No. 1, 5A-6A (March 1969)</p> <p>Smith and Chubb (1957) found that 9-week-old cockerels infected orally with <u>Salmonella gallinarum</u> and given a diet of 10 percent fish meal and 90 percent wheat meal showed greater survival than cockerels similarly infected and given a diet of 40 percent fish meal and 60 percent wheat meal. The present authors carried out similar experiments using 2-week-old cockerels and diets suitably supplemented with vitamins and trace elements. The results in these experiments were the same as found by Smith and Chubb. The level of protein in two diets consisting of semipurified nutrients, one diet containing 16 percent casein plus gelatin and 84 percent wheat meal and the other containing 36 percent casein plus gelatin and 64 percent wheat meal, did not affect the survival rate of the chicks eating the diets. Also, using diets similar to those containing fish meal and wheat meals but with meat meal replacing the fish meal, survival of the infected chicks was not affected by the level of meat meal in the diet. [1 reference]</p> <p>COMMERCIAL FISHERIES ABSTRACTS VOL 22 NO 9 PAGE 7 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</p> <p>Abstracter: F. T. Piskur</p>



withdrawn and replaced with yellow grease. The fatty acid composition of the liver, adipose fat, and thigh and breast muscles of the broilers was determined. The amount of four  $\omega$ -3-type fatty acids (20:4 $\omega$ 3, 22:5 $\omega$ 3, 22:6 $\omega$ 3, and 22:7 $\omega$ 3) increased as the number of weeks that menhaden fish oil was included in the diet of the broilers increased. [The first number describing the fatty acid is the length of the carbon chain, that is, the number of carbon atoms in the fatty acid. The second number indicates the number of double bonds. The third number following the  $\omega$  indicates the position in the chain of the carbon containing the first double bond as counted from the carbon in the terminal methyl group.] The liver had the highest total content of  $\omega$ -3 fatty acids of the four tissues studied; adipose fat, the least. The breast muscle contained more  $\omega$ -3 fatty acids than the thigh muscle. Favorable organoleptic values for the broiler tissues were obtained when fish oil was withdrawn at the fourth week of the feeding period. Results were obtained when the fish oil was withdrawn at the last 4 weeks.

[Abstract: F. T. Piskur]

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DISEASE, NUTRITION DISCUSSED AT WASHINGTON POULTRY EVENT

Andrews, Daniel K. (Western Washington Research and Extension Center, Washington State University, Puyallup)  
Feedstuffs 41, No. 17, 52, 54-55 (April 26, 1969)

The author summarizes the discussions that were held at the 11th annual Washington Poultrymen's Institute on (1) current problems of diseases in poultry and (2) nutrition of poultry. Topics in the first area were coliform airsacculitis, mycotoxins, Marek's disease, and "hysteria." Nutrition topics included feeding studies with herring and hake fish meal, factors affecting hatchability, use of cereal grains in laying rations, phase feeding, and effect of light in the growing environment.

Gordon Bearse, Western Washington Research and Extension Center (WVREC), reported that Pacific Ocean hake fish meal can be used satisfactorily in starter and developer rations for growing White Leghorn pullets. As much as 10 percent hake fish meal or herring meal may be used in starter rations and as much as 7.5 percent in developer rations. From the standpoint of acceptability of eggs, the meals may be used up to 5 percent.

Larry Berg (WVREC) reported that hake, herring, and anchovy meals fed at the 5 percent level in rations containing 0 and 5 percent meat meal gave excellent results when used in fryer rations. No significant differences were found between performances of the meals. [10] [10] tables [Abstract: F. T. Piskur]

material was discharged from the dryer; no seal was applied at the raw-material inlet, since the pressure there is neutral. Inspection ports and other leak-prone points were sealed in a routine manner.

An assessment of the results obtained after the dryer had been tested for several weeks showed that recirculation was virtually 100 percent and that no vapors were being discharged into the atmosphere. The quantity and quality of the fish meal produced were not affected by changes in the system, though the final moisture content of the dried material was higher than that produced in dryers where the air is less humid. Corrosion of plant components seemed to be no more pronounced than when the air was not recirculated.

Based on these results, the authors conclude that the recirculating-air system is feasible for any type of steam dryer and for a whole range of materials from uncooked white fish to presscake made from oily fish. They recommend that the entire dryer system be made airtight except where pressure is neutral, that the condenser reduce the temperature of the air to 40° C. or lower, that the rate of circulation of air through the dryer be no more than 2 lb./lb. of water evaporated (preferably 1 lb./lb.), that materials for condenser and ducting be chosen with the corrosive characteristics of water vapor and ammonia in mind (possibly plain steel, stainless steel, and cast iron would do), that ducting be kept as short and unadorned as possible, and that (to reduce fouling and corrosion) water already used and perhaps heated in some other part of the plant be used for an initial state of direct condensation preceding the indirect condenser.

[2] figures, 4 references

4.0 (Cross Reference: 5.0)

FISH OILS-FATTY ACID COMPOSITION, ENERGY VALUES, METABOLISM, AND VITAMIN CONTENT

Kifer, Robert R., and David Miller (Technological Laboratory, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, P.O. Box 128, College Park, Maryland 20740)

Fishery Industrial Research 5, No. 1, 25-37 (May 1969)

This paper is a general review of the subject of fish oils. Part I presents information on the fatty acid composition of fish oils, of the lipids from cultures of the diatom *Skeletonema costatum*, of algae, of zooplankton, and of fish livers. Data on the fatty acid composition of plant oils are given for comparative purposes.

Part II deals with the biological properties of fish oils particularly the digestion and absorption of fish oils and the biological significance of fish oils. The appendix contains an explanation of the nomenclature of fatty acids. [5 figures, 10 tables, 12 references]

[Abstract: F. T. Piskur]

4.2 IMPROVED METHOD FOR DETERMINATION OF THE POSITION OF DOUBLE BONDS IN POLYENOIC FATTY ACID ESTERS

Roehm, J. N., and O. S. Privett (University of Minnesota, The Hormel Institute, Austin 55912)

Journal of Lipids 10, No. 2, 245-246 (March 1969)

The paper describes an improved method for determining the position of double bonds in polyenoic fatty acid methyl esters. The methyl esters are partially reduced with hydrazine without prior hydrolysis to the free fatty acid, and the resulting monoenes are identified by reductive ozonolysis.

[Abstract: F. T. Piskur]



6.199

EFFECT OF FISH-CORN MIXTURES ON GROWTH AND ANTIBODY FORMATION IN RATS

Smith, Mary Marla, and Mary Alice Kenney (Food and Nutrition Department, Iowa State University, Ames)  
Journal of the American Dietetic Association 54, No. 6, 500-503 (June 1969)

Interrelation of nutrition and infection are recognized: well nourished individuals tend to resist many infections better than undernourished individuals, and animals fed certain unbalanced proteins may produce higher titers of antibody than those given amino acid supplements. In the present study, the authors measured antibody production in the rat to determine whether those mixtures of corn and fish proteins that exerted the greatest effects on growth and on the liver would also support an immune response. Growing female rats were used. The control group was fed the laboratory stock diet. Six test groups were fed isonitrogenous diets containing corn, with 0, 10, 20, 30, or 40 percent of the nitrogen furnished by fish meal, or 3 percent of the nitrogen furnished by lysine. The rats were immunized 6 days before the end of the 3-week test period.

As the percentage of fish meal was increased in the diet, there was a progressive increase in weight of the body, in weight of the liver, and in the total hepatic nitrogen content of the rats. Those rats that received 40 percent of their dietary protein from fish, grew as rapidly as the control rats. Rats fed the corn-lysine diet gained only as much weight as those fed the unsupplemented corn diet (these groups showed the lowest weight gain of all test groups).

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UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE

Abstracter: F. T. Piskur

6.34

MARINE PHYTOPLANKTON FATTY ACIDS

Ackman, R. G., and C. S. Tocher (Fisheries Research Board of Canada, Halifax Laboratory, Halifax, Nova Scotia) and J. McLachlan (National Research Council, Atlantic Regional Laboratory, Halifax, Nova Scotia)  
Journal of the Fisheries Research Board of Canada 25, No. 8, 1603-1620 (August 1968)

The purpose of this study was to determine the fatty acid composition of several unicellular marine algae cultured under identical conditions in order to detect possible differences in taxonomic groups. In addition, examination was made of the occurrence of "essential" polyunsaturated fatty acids that might be present in those unicellular algae suitable for rearing filter-feeding organisms such as oysters. The twelve species of algae cultured are tabulated below. The total fatty acids were determined by gas-liquid chromatography.

The authors detected some specific fatty acid relationships paralleling taxonomic groupings, but the distribution of individual fatty acids within the various algal classes showed relatively large variations. The fatty acids of the four species of Bacillariophyceae had iodine values of less than 150, whereas the fatty

Class	Species
Bacillariophyceae	Phaeodactylum tricornutum
	Skeletonema costatum
	Cyclotella cryptica
Chrysophyceae	Thalassiosira fluviatilis
	Syracosphaera carterae
	Monochrysis lutheri
Xanthophyceae	Olisthodiscus sp.
Dinophyceae	Amphidinium carterii
Cryptophyceae	Unknown cryptomonad
Chlorophyceae	Dunaliella tertiolecta
Prasinophyceae	Tetraselmis (Platymonas sp.)
Rhodophyceae	Porphyridium sp.

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UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE

Abstracter: F. T. Piskur

6.54

FISH PROTEIN CONCENTRATE FROM BOMBAY-DUCK (HARPODEN NEHEKEUS) FISH: EFFECT OF PROCESSING VARIABLES ON THE NUTRITIONAL AND ORGANOLEPTIC QUALITIES

Sen, D. P., T. S. Sayanarayana Rao, S. B. Kadkol, M. A. Krishnaswamy, S. Venkata Rao, and N. L. Lahiry (Central Food Technological Research Institute, Mysore, India)  
Food Technology 23, No. 5, 85-90 (May 1969)

Annual landings of Bombay duck, a commercial marine fish, in India are about 80,000 tons, about 11 percent of the total marine fisheries catch. About 80 percent of the catch is sun dried. A better method of preserving the fish is needed to provide a product that is stable and can be used in a variety of food preparations. The preparation of fish protein concentrate is an alternate method of preservation. The purpose of the present study was to examine the effects of certain processing treatments on the quality, nutritional value, and bacterial aspect of the fish protein concentrate prepared from Bombay duck.

The following test samples of FPC were prepared from the Bombay duck:

Sample 1. Whole fish were sun dried then shredded. The shredded material was extracted with ethanol. Residual solvent was removed from the extracted material. The protein concentrate was pulverized.

Sample 2. Dressed fish were treated as described for sample 1.

Sample 3. Whole fish were cooked in water. The cooked material was pressed. The

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Abstracter: F. T. Piskur

6.54

PROBLEMS IN THE DEVELOPMENT OF FISH PROTEIN CONCENTRATES

Lovern, J. A. (Torry Research Station, Aberdeen, Ministry of Technology, Aberdeen, Scotland)  
Proceedings of the Nutrition Society 28, No. 1, 81-85 (March 1969)

Most species of fish are edible and most of the abundant species are used in various parts of the world. The problems involved in preservation and distribution limit the wider use of fish in improving the nutritional status of peoples of the world. The author believes that conversion of a general food, such as fish, into a food additive, such as fish protein concentrate (FPC), can only be justified if the additive offers some overwhelming advantage in economic feasibility, in price, or in acceptability to the consumer. He mentions briefly some of the past and current attempts to produce FPC, considers the matter of types of FPC products, points out some of the technological and economic problems involved in FPC production, and discusses the matter of introduction of FPC products into the diet. The paper states that the view has strengthened in various official quarters, including the Protein Advisory Group of the United Nations, that to be acceptable to the poverty-stricken, protein-starved peoples of the world a food must also be acceptable to the sophisticated palates (and to the esthetic concepts) of the well-fed.

The author closes his paper by stating the following:

1. He agrees with the U.S. Bureau of Commercial Fisheries that FPC must be based on whole fish; however, he cannot accept the case for FPC to the degree of (over)

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Abstracter: F. T. Piskur



6.190 NUTRITIVE CONTENT OF NORWEGIAN HERRING FISH MEAL  
EVALUATED BY CHEMICAL METHODS

Kifer, R. R., W. L. Payne, and M. E. Ambrose (Technological Laboratory, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, College Park, Maryland) *Feedstuffs* 41, No. 17, 18-19 (April 26, 1969)

The paper contains data on the chemical composition of Norwegian herring fish meal. Norwegian herring meal is manufactured from two species of *Clupeidae*: *Clupea harengus* (wild) and *C. sprattus* (sprat or brisling). The samples of meal were representative of those meals available to domestic feed formulators. Tables 1 to 4 contain data on proximate composition (Kjeldahl protein, ethyl ether extracted fat, moisture, and ash), total fat, amino acids, and minerals. Table 5 is a statistical summary of the nutrient composition data that includes averages, ranges, standard deviations, standard errors, and coefficients of variation. Also in table 5, the average content of each constituent decreased by one-half a standard deviation is listed in order to establish a handbook value adjusted to include a safety factor. [5 tables, 8 references] [Abstract: F. T. Pliskur]

6.34 AGAR-AGAR GELS

Japanese Patent 780/69  
Takagi, N. (pat.)  
Food Technology 23, No. 6, 60 (June 1969)

This is a method for soaking alginate gels in aqueous solutions containing seasonings.  
[Abstract: F. T. Pliskur]

6.37 CHLORELLA PROCESSING

Japanese Patent 786/69  
Chlorella Ind. Co. Ltd.  
Food Technology 23, No. 6, 60 (June 1969)

Soluble proteins are coagulated and extracted to improve the flavor of Chlorella products.  
[Abstract: F. T. Pliskur]

6.54

Ein Verfahren zur Herstellung von Fischproteinkonzentrat  
(A METHOD FOR THE PRODUCTION OF FISH PROTEIN CONCENTRATE)

Pactow, A., and H. J. Papenfuss  
Lebensmittel Ind. 15, No. 8, 301-303 (1968)  
Food Science Abstracts 2, No. 12, Abstr. 68/1714, 609 (December 1968)

Many solvents and solvent mixtures are available for extracting fats from dry powdered materials and the possibility of using some of these for extracting fats from fish meal is considered. It was considered that a mixture of isopropanol and water would be the most satisfactory and the extraction process is described. The economics of the process are discussed. [8 references] [Extracted: [unclear] 01 '69, 1]

The protein efficiency ratio (PER) of the fish protein concentrate prepared from whole fish or dressed and beheaded fish was not significantly different from the PER's of the FPC prepared from raw dried fish or from cooked, pressed, dried meal. FPC prepared from fish cooked in water acidified to pH 5.5 had a relatively high PER value of 3.93 (range of averages of PER values of all FPC samples was 3.63 to 3.93) and had a low level of fishy odor. Extraction of the fish material with hexane had no adverse effect on the quality of the FPC product. The lysine, methionine, cystine, and tryptophan content was about the same for all samples. "Chapati" prepared from wheat flour containing 5 percent of FPC were of acceptable quality and had no fishy odor or flavor. [12 tables, 12 references]

sophistication now envisaged] presumably the arguments presented for the production of a tasteless and odorless FPC.

2. He suggests that alternative ways of producing FPC should be studied. One approach suggested was to comminute whole fish, enclose the comminuted fish in a suitable container (possibly of plastic), and then heat process the packaged food. The resulting product would be tasty and stable, and a food in its own right. The author, in making this suggestion, challenges the whole concept of concentrating fish at the expense of much of its food value and of its appetite appeal.

3. Although argument may be made that FPC could be produced from species other than fish, the author's view is that little effort has been expended to make these species acceptable by suitable processing. He points out that the Food and Agriculture Organization of the United Nations always regarded FPC as only one approach and includes other methods of processing fish. [unclear] 01 '69, 1]

residue was dried, then extracted with ethanol. Residual solvent was removed from the extracted material. The protein concentrate was pulverized. Dressed fish were treated as described for sample 3. Dressed fish were treated as described for sample 3, but the pH of the water was adjusted to 5.5 by the addition of phosphoric acid. Dressed fish were treated as described for sample 3 except that hexane was used instead of ethanol. Dressed fish were azeotropically dried with n-heptane. The residue was extracted with ethanol. Excess solvent was removed. The protein concentrate was pulverized.

The protein efficiency ratio (PER) of the fish protein concentrate prepared from whole fish or dressed and beheaded fish was not significantly different from the PER's of the FPC prepared from raw dried fish or from cooked, pressed, dried meal. FPC prepared from fish cooked in water acidified to pH 5.5 had a relatively high PER value of 3.93 (range of averages of PER values of all FPC samples was 3.63 to 3.93) and had a low level of fishy odor. Extraction of the fish material with hexane had no adverse effect on the quality of the FPC product. The lysine, methionine, cystine, and tryptophan content was about the same for all samples. "Chapati" prepared from wheat flour containing 5 percent of FPC were of acceptable quality and had no fishy odor or flavor. [12 tables, 12 references]

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## OYSTER SHELLS IN BEEF FINISHING RATIONS

Matsushima, J. K. (Animal Science Department, Colorado State University), R. J. McLaren (Neepeawa, Manitoba, Canada), and C. P. McCann (Lewiston, Idaho) Beef Nutrition Research (no pagination) (February 28, 1969) (Animal Science Department, Colorado State University, Fort Collins)

Roughages are included in beef finishing rations generally for two reasons: to provide various nutrients to the ration, and to provide some roughness factor within the rumen. Therefore, whenever a substitute or partial substitute is made in a ration these factors should be considered.

During the past few years oyster shells have not been shown to be a very satisfactory substitute for roughage in ruminant rations. Most of the early experimentation involved the complete replacement of the roughage with oyster shells and in many trials oyster shells were fed during the entire feeding period. Following a review of the various feeding programs undertaken previously with oyster shells it became apparent that if oyster shells might be used to an advantage in feedlot rations certain modifications appeared to be necessary.

Two experiments were conducted recently at Colorado State University to determine if oyster shells could be used as a partial substitute for roughage in a beef finishing ration.

Summary and conclusions.--Both trials involved yearling steers with starting weights averaging approximately 680 pounds and feeding periods of 142 days each. For those groups which were fed oyster shells the oyster shells were fed at the

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Reprinted in part

## 7.520 SEPARATE ELUTION BY ION-EXCHANGE CHROMATOGRAPHY OF SOME BIOLOGICALLY IMPORTANT SELENOAMINO ACIDS

Martin, John L., and Marlene L. Gerlach (Department of Biochemistry, Colorado State University, Fort Collins 80521)  
Analytical Biochemistry 29, No. 2, 257-264 (May 1969)

Selenium is important in nutrition as a micronutrient; however, it is also a toxic agent. In some biological systems selenium replaces the sulfur in sulfur-containing compounds. Various researchers have reported the presence of selenocystine, selenomethionine, Se-methylselenocystine, selenocystathionine, and selenomethionine in certain biological tissues. Martin and Cummins (1966) described ion-exchange chromatographic procedures that permitted the separate elution of selenocystine and selenomethionine from other amino acids in an amino-acid mixture. The new accelerated procedures described in the present report are capable of separately eluting three additional selenoamino acids--selenocystathionine, Se-methylselenocystine, and selenomethionine as well as their sulfur analogs. The authors used modifications of the ion-exchange elution procedures described by Spackman, Stein, and Moore (1958). The new procedures were used to characterize the selenoamino acids in the seeds of certain selenium accumulator plants. [6 figures, 3 tables, 18 references]

Abstracter: F. T. Piskur

## PROBLEMS INVOLVED IN THE QUANTITATIVE EXTRACTION OF GLYCOCEN AND HIGH-ENERGY PHOSPHORUS COMPOUNDS IN FROZEN COD MUSCLE

Nowlan, Sandra S., W. J. Dyer, and Doris I. Fraser (Fisheries Research Board of Canada, Halifax Laboratory, Halifax, Nova Scotia)  
Journal of the Fisheries Research Board of Canada 25, No. 8, 1525-1538 (August 1968)

The authors examined techniques of sampling and weighing frozen cod muscles in order to develop a method of extracting glycocen and acid-labile phosphorus with a minimum of losses through decomposition. They studied the effect of holding frozen cod muscle in cold 0.3 N HClO<sub>4</sub> (perchloric acid) or in 30 percent KOH (potassium hydroxide) at room temperature prior to extraction and compared the yields of glycocen obtained by the HClO<sub>4</sub> and the KOH extraction methods.

Extraction of cod muscle with 0.3 N HClO<sub>4</sub> followed by digestion of the residue in KOH yielded an average of 16 percent more glycocen than did extraction with KOH. The authors suggest that glycocen may be partially degraded during digestion from 23 percent in unfrozen muscle to about 40 percent in the muscle frozen in liquid nitrogen or frozen slowly. Significant degradation of glycocen and high energy phosphorus compounds in frozen prerigor cod muscle may be avoided by weighing the samples in insulated beakers chilled by liquid nitrogen and by homogenizing the material immediately on addition of the acid extracted. Glycocen and

(over)

Abstracter: F. T. Piskur

## 7.9 A GENERAL METHOD FOR THE DETERMINATION OF ORGANOPHOSPHORUS PESTICIDE RESIDUES IN RIVER WATERS AND EFFLUENTS BY GAS, THIN-LAYER AND GEL CHROMATOGRAPHY

Askew, J., J. H. Ruzicka, and B. B. Wheals (Ministry of Technology, Laboratory of the Government Chemist, Cornwall House, Stamford Street, London, S.E.1, England)  
Analyst 94, No. 1117, 275-283 (April 1969)

Organophosphorus pesticides are being used to a greater extent in agriculture as the trend to supplement or replace organochlorine pesticides continues. In Canada, about 40 organophosphorus pesticides have met the requirements of the Minister of Agriculture's pesticide safety precaution scheme and are in substantial use. Ruzicka et al. have shown in a previous study that organophosphorus pesticides, although more labile than their organochlorine counterparts, decay in river water at rates sufficiently slowly to constitute a potential pollution hazard. Therefore, the authorities will increasingly be called upon to undertake analyses for organophosphorus pesticides. The present paper describes the separation and identification of some of these compounds in samples of river waters and sewage effluents by the use of gas, thin-layer, and gel chromatography.

The pesticides are first extracted with chloroform then determined by gas and thin-layer chromatography. The method described includes the details of an improvement that enables detection of all the pesticides on thin-layer chromatoplates with a phosphorus-specific ammonium molybdate spray. Gel chromatography

(over)

Abstracter: F. T. Piskur



7.50

METHOD FOR CREATING RAPID CELLULAR TEMPERATURE PERTURBATION  
Lee, In-Young, and Britton Chance (Department of Biophysics and Physical Biochemistry, Johnson Research Foundation, University of Pennsylvania, Philadelphia 19104)  
Analytical Biochemistry 29, No. 2, '331-338 (May 1969)

The relaxation times of only a few intercellular reactions are known, mostly because suitably rapid transition is difficult to create and difficult to detect changes rapidly enough are difficult to construct. The present paper describes a method that will create an adequately rapid transient without introducing changes in the chemical environment of cells and tissues.

The method uses a simple flash heating apparatus to create a temperature perturbation in biological systems. The apparatus consists of five major parts: (1) a 200-joule xenon flash lamp, the energy associated with the flash discharge is transferred to a cylindrical silver cuvette surrounded by the flash tube for uniform light absorption; (2) a cylindrical silver cuvette for fast thermal equilibration; (3) a device to circulate a forced air stream, to control the residual heat in the flash tube; and (4) a thermocouple for the intracellular thermal transient, usually a thermocouple and a cathode ray oscilloscope. The authors state that the jump was obtained within 0.5 msec. The authors state that the jump was "chemically pure" and that they could detect, microscopically, little or no damage to the cells.

[Abstract: F. T. Piskur] [5 figures, 10 references]

(Cross Reference: 9.82) 55.9

rate of one-half pound per head daily only during the last 001 days of the feeding period. A higher concentrate ration was fed in the second trial but the ingredients which made up the rations in the two trials were virtually the same. Perhaps the major deviation was that coarsely cracked corn was fed in the first trial and flaked corn was used in the second trial.

Based upon the results obtained from these two trials the following conclusions may be drawn or suggestions indicated:

1. When roughages are scarce, roughage costs are high or when handling of roughages in a feedlot operation becomes a problem, oyster shells at the rate of one-half pound per head daily can substitute for two pounds of air-dry oyster shells during the feeding period. (a) Oyster shells do not completely replace the roughage of the feeding period. (b) Oyster shells do not completely replace the roughage in a ration comparable to those used in these trials.
2. Dried beet pulp pellets fed at the rate of three pounds per head daily enhanced the performance of feedlot cattle when oyster shells were included in the finishing ration.
3. When oyster shells were fed at a rate of one-half pound per head daily during the feeding period, comparable performance was obtained with groups of cattle receiving either two pounds of oyster shells or two pounds of corn silage as roughage.
4. The feeding of oyster shells to weanling calves showed no consistent pattern with regard to liver abscesses. Indications were present, however, noting the fact that rumen contents were apparent in the group where no roughage (hay or alfalfa) was fed during the last two-thirds of the feeding period. Research data indicate a high correlation between rumen contents and liver abscesses.

[Abstract: 9, 2] [2 figures]

6.7

pesticides---this procedure is also described. [References: 1] [3 tables, 4 references]

DETERMINATION OF FREE HYDROGEN CYANIDE IN RIVER WATER  
BY A SOLVENT-EXTRACTION METHOD

Montgomery, H. A. C., Deirdre K. Gardiner, and J. G. G. Gregory (Water Pollution Research Laboratory, Elder Way, Stevenage, Hertfordshire, England)  
Analyst 94, No. 1117, 284-291 (April 1969)

Previous studies have shown that the substance usually responsible for the toxicity of cyanide solutions to fish is free hydrogen cyanide, and not cyanide ion. Consequently, there is a need for an analytical method for determining hydrogen cyanide. The method described in this paper for the determination of undissociated hydrogen cyanide in river waters is designed to avoid disturbance of the equilibrium between hydrogen cyanide, cyanide ion, and complex cyanides during the determination. The method can be used in the range of 0 to 2 mg. of hydrogen cyanide per liter; less than 0.01 mg. of hydrogen cyanide per liter is detectable. [5 tables, 17 references]

[Abstract: F. T. Piskur]

665.7

[Abstract: F. T. Piskur]

The nutritive value of protein in foods is directly related to the available lysine content. Several methods have been proposed for determining available lysine in feedstuffs. This paper reports on a comparison of the method of Carpenter (1960) and Roach et al. (1967) by determining the available lysine in 12 samples of meat and bone meal, fish meal, soybean meal, and groundnut meal. The results showed that there was good agreement between the two methods when tested on animal protein concentrates, but the Carpenter method gave notably higher values than the Roach et al. method when tested on vegetable protein concentrates. With the plant proteins, the difference in the values between the two methods was associated with the lower recoveries of  $\epsilon$ -DNP lysine.

A COMPARISON OF THE CARPENTER AND SILCOCK METHODS  
FOR AVAILABLE LYSINE DETERMINATION IN PROTEIN CONCENTRATES  
AND DIETS

Ostrowski, H. (Rowett Research Institute, Bucksburn, Aberdeen, AB2 9SB, Scotland)  
Proceedings of the Nutrition Society 28, No. 1, 3A-4A (March 1969)

7.523



# MALIC ENZYME: EVIDENCE FOR TWO MOLECULAR FORMS IN THE SARCOPLASM OF FISH SKELETAL MUSCLE

Gould, Edith (Technological Laboratory, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Gloucester, Massachusetts)  
Journal of the Fisheries Research Board of Canada **25**, No. 8, 1581-1589 (August 1968)

The malic enzyme activity in the centrifuged tissue fluid of the skeletal muscle of haddock (after the muscle was frozen and thawed) is roughly double that in the fluid of unfrozen, haddock (Gould, 1965). The tissue fluid (after freezing and thawing) of unfrozen muscle of haddock is about the same as that in the fluid of unfrozen haddock. In haddock muscle, there appears to be at least two forms of malic enzyme having different stabilities; one enzyme is free in the sarcoplasm and the other is readily solubilized by freezing and thawing the tissue. The purpose of the present study was to determine whether homogenization of the tissue might not also solubilize the latent malic enzyme activity (that is, increase the enzyme activity in the sarcoplasm as was previously shown to be effected by freezing and thawing the tissue); to examine the relative stabilities of the free malic enzyme activity (the enzyme activity present in the sarcoplasm of unfrozen whole tissue) and the latent malic enzyme activity; and to attempt to separate the two forms of malic enzyme.

The authors found a latent form of malic enzyme activity (which activity appears in the centrifuged tissue fluid of haddock skeletal muscle after the tissue has been frozen and thawed) in the fluid of unfrozen haddock muscle after the tissue has been homogenized. This form of malic enzyme is more labile to refrigerated storage, ionizing radiation, and heat than is its soluble counterpart (the

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UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE

Abstracter: F. T. Piskur

# LATE-WINTER WATERS OF YUCATAN STRAITS A 1968 'GERONIMO' SURVEY IN GULF OF MEXICO

Armstrong, Reed S. (Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Galveston, Texas 77550)  
Commercial Fisheries Review **31**, No. 2, 33-36 (February 1969)

Oceanographic surveys in the Gulf of Mexico have demonstrated that the Yucatan Straits is the area where circulation dynamics are the most intense. For this reason, the water between the Florida Keys, Cuba, and the Yucatan Peninsula was selected for oceanographic investigations during the first manned Apollo space-flight in 1968. While the spacecraft is operating its sensors, a BCF [Bureau of Commercial Fisheries] vessel will survey these waters on a "ground truth" mission. It is hoped this cooperative work will resolve numerous questions about the use of sensors aboard spacecraft to study the oceans.

Between February 8 and March 5, 1968, cruise 20 of the R/V Geronimo (BCF, Galveston, Texas) was made in the Yucatan Straits area. The purposes were to: (1) determine if the survey area was large enough to cover the circulation patterns that might be detected by the Apollo spacecraft sensors--and if the station grid was adequate to bring out these features; and (2) examine the waters in this area of the Gulf of Mexico to establish how the deep water in the Caribbean flows over the relatively shallow sill (about 2,100 m. deep) of the Yucatan Straits.

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Author's abstract

# THE ICE DRIFTS BACK TO ICELAND

Kristjansson, Leo (Science Institute, University of Iceland, Reykjavik)  
New Scientist **41**, No. 639, 508-509 (March 6, 1969)

The standard of living in Iceland, although one of the highest in the world, is extremely vulnerable to the onslaughts of nature. For example, a drop of 1° C. in summer spells a 15-percent reduction in the farmer's yield. The encroachment of Arctic drift ice along the north coast can block shipping for months at a time. Moreover, if the drift is as severe as it has been the past two seasons, it forces the fishermen to chase the herring schools, which avoid the increasingly colder waters near Iceland, all the way to Jan Mayen Island and the Spitzbergen Archipelago. The consequent drop in herring exports, which support a broad segment of the economy, is a major cause of the two recent devaluations of the Icelandic króna [24.6 percent devaluation in 1967, setting the króna at a par value of 57 to the US\$1, and an additional 35.2 percent devaluation in late 1968, giving the króna a par value of 88 to the US\$1].

The understandable excitement and worry of the Icelandic populace about the cooling trend and its economic implications has led to the convening in Reykjavik of more than 50 local historians, geoscientists, and applied scientists to discuss ways of forecasting and meeting the difficulty. The conferees are studying the data provided by a detailed temperature record recently obtained by oxygen isotope analysis of a deep core taken through the Greenland ice sheet; layers of volcanic Icelandic ash containing botanical and archaeological remains that may

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Abstracter: L. Baldwin

# OCEANOGRAPHIC CONDITIONS IN THE NORTHEAST PACIFIC OCEAN AND THEIR RELATION TO THE ALBACORE FISHERY

Owen, Robert W., Jr. (Fishery-Oceanography Center, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, La Jolla, California 92037)  
U.S. Fish and Wildlife Service, Fishery Bulletin **66**, No. 3, 503-526 (September 1968)

This paper describes initial environmental conditions encountered by albacore, Thunnus alalunga (Bonnaterre), in their annual entry to the region off the northwest coast of the United States, describes the physical mechanisms that produce these conditions, and indicates their influence on the highly variable number of albacore available to the fishery. The region studied extends from the coast of Oregon and Washington to long. 132° W. between lats. 41° N. and 48° N., within which the northernmost part of the American coastal fishery for albacore usually has been confined.

Upwelling, effects of runoff from land, and the excess of precipitation over evaporation produce annually recurrent patterns of distribution of variables. This recurrent aspect is used to distinguish three spatial provinces above and two provinces below the main halocline, each of which reflects the balance of processes affecting it. Variations in the distributions of variables from year to year are shown to be attributable to changes in wind field, in fresh-water discharge from land, and in advection. These variations do not, however, obscure the basic patterns generated by dominant processes.

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Abstracter: L. Baldwin



Heise, John J. (Georgia Inst. of Technol., Atlanta, Georgia) Chemical Abstracts 70, No. 10, 40559t (March 10, 1969)

Unpublished results of a study of the distribution of albacore over the study area is inferred to be sensitive to spatial and year-to-year differences in temperature and in salinity. Higher temperatures, produced by greater retention of heat in the surface layer of the province dominated by effects of land runoff, may give rise to greater concentrations of albacore in this province. Salinity, to which temperature is inversely related, may control the degree to which spatial temperature differences can be effective, possibly by its influence on osmotic pressure. If future investigation confirms this hypothesis, success of the fishery will be predictable from pre-season information on wind field, geostrophic flow, and Columbia River discharge. [4 figures, 3 tables, 34 references]

9.17 A RAPID METHOD OF TAGGING FISH  
Sakuda, Henry M. (Division of Fish and Game, Honolulu, Hawaii 96813)  
U.S. Fish and Wildlife Service, Fishery Bulletin 66, No. 3, 573-574 (September 1968)  
A unique tagging procedure has been devised that requires but two persons, is rapid, and provides accurate permanent records that can be rechecked as many times as necessary. Methods used up to this time require several men, and the records obtained are only temporary and often inaccurate.  
Generally, our tagging method is an extension and modification of fish measuring techniques described by Wollaston (1928), Thompson (1929), and recently by Joeris (1959), who used a measuring board to which plastic strips (exposed or undeveloped X-ray film strips) were attached. The fish is laid on the measuring board with its snout against a stopblock, and the length is recorded by punching a hole in the film. The method described here involves the same general technique except that X-ray films are also specially prepared to hold and dispense tags in numerical order and to retain paired information on tag numbers and length of fish tagged. [1 figure, 4 references]

9.16 The distribution of available albacore over the study area is inferred to be sensitive to spatial and year-to-year differences in temperature and in salinity. Higher temperatures, produced by greater retention of heat in the surface layer of the province dominated by effects of land runoff, may give rise to greater concentrations of albacore in this province. Salinity, to which temperature is inversely related, may control the degree to which spatial temperature differences can be effective, possibly by its influence on osmotic pressure. If future investigation confirms this hypothesis, success of the fishery will be predictable from pre-season information on wind field, geostrophic flow, and Columbia River discharge. [4 figures, 3 tables, 34 references]

Sipos, J. C., and R. G. Ackman (Fisheries Research Board of Canada, Halifax Laboratory, Halifax, Nova Scotia) Journal of the Fisheries Research Board of Canada 25, No. 8, 1561-1569 (August 1968)

The common (pink) jellyfish (*Cyanea capillata*) is one of hundreds of species of related organisms that are common in North Atlantic temperate waters. This paper reports on the fatty acid composition of the pink jellyfish collected off Nova Scotia and New Brunswick, Canada. The lipids were isolated and separated by gel filtration into polar lipids, triglycerides, and sterol. The fatty acid composition was determined by gas-liquid chromatography. A high proportion of polyunsaturated fatty acids was present. The jellyfish has a large surface area and no obvious depot fat reserves, and much of the lipid appears to be involved in the cell membranes. The data obtained indicate that this species of jellyfish, although containing only very low amounts of lipids in proportion to its wet weight, contains a lipid system similar to those of lower marine animals and phytoplankton feeders in general. There appears to be a special relationship involving arachidonic acid and *C. capillata* in the diet of the Atlantic leatherback turtle (*Dermochelys coriacea coriacea*). [3 tables, 20 references]

9.6 DINOFLAGELLATES IN THE CARIBBEAN  
(Cross Ref.: 1.0119)  
Wood, E. J. Ferguson (Institute of Marine Sciences, University of Miami, Miami, Florida)  
Dinoflagellates of the Caribbean Sea and Adjacent Areas, 144 pp. (n.d.) (University of Miami Press: Miami, Florida) Price \$12  
Fishing News International 8, No. 5, 118, 121 (May 1969)  
The main section of this book describes, illustrates, and gives locations for some 400 species of dinoflagellates, an important link in the marine food chain. An appendix treats the six species of silicoflagellates that have been reported as inhabiting the Caribbean. The illustrations are detailed, and the bibliography is extensive. [Abstract: L. Baldwin]

9.6 The distribution of available albacore over the study area is inferred to be sensitive to spatial and year-to-year differences in temperature and in salinity. Higher temperatures, produced by greater retention of heat in the surface layer of the province dominated by effects of land runoff, may give rise to greater concentrations of albacore in this province. Salinity, to which temperature is inversely related, may control the degree to which spatial temperature differences can be effective, possibly by its influence on osmotic pressure. If future investigation confirms this hypothesis, success of the fishery will be predictable from pre-season information on wind field, geostrophic flow, and Columbia River discharge. [4 figures, 3 tables, 34 references]



PRELIMINARY ANALYSIS OF THE CATCH CURVE  
OF THE PACIFIC SARDINE, SARDINOPS CAERULEA GIRARD

Hayashi, Sigeiti (Nankai Regional Fisheries Research Laboratory, Kochi, Japan)  
U.S. Fish and Wildlife Service, Fishery Bulletin 66, No. 3, 587-598 (September 1968)

This is a report on a method of estimating age-dependent changes in rates of natural mortality and the age- and season-dependent changes in rates of availability of the Pacific sardine. It includes estimates of the virtual average catch curve and relative year class strengths and deviations of individual curves from these estimates. The calculations are carried out with each of three sets of data: total California catch, catch per unit of effort in central California, and catch per unit of effort in southern California.

The average catch curve allows an estimate to be made of the increase in the natural mortality rate during fully recruited ages. The deviations of individual curves are assumed to represent the annual changes in rate of availability of each year class under a certain condition. The deviations of different age groups in the same years are compared to give a general idea of age-dependent change in the rate of availability in a year. Availability is also examined in regard to ocean temperatures preceding the fishing season.

A detailed model is proposed to estimate parameters relevant to the sardine population on the basis of the above examination as well as on the basis of earlier estimates of rates of natural mortality and availability. Consideration of the detailed model indicates the necessity for several sources of information to establish methods for predicting the sardine catch.

[3 figures, 6 tables, 2 references]

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Author's abstract

EFFECT OF STARVATION ON FREE FATTY ACID LEVEL IN BLOOD PLASMA  
AND MUSCULAR TISSUES OF RAINBOW TROUT (SALMO GAIIRDNERI)

Bilinski, E., and L. J. Gardner (Fisheries Research Board of Canada, Vancouver Laboratory, Vancouver, British Columbia)

Journal of the Fisheries Research Board of Canada 25, No. 8, 1555-1560 (August 1968)

Free fatty acids (FFA) in blood plasma are the dynamic form of transport of lipid reserve from fat depot to the various tissues for utilization (Fridrickson and Gordon, 1958). Enzymic oxidation of FFA in fish muscle follows the same general pathway as in mammals (Bilinski and Jonas, 1964; and Jonas and Bilinski, 1964); however, the mechanism of mobilization and transport of fat reserve to the muscle for utilization is not yet well understood. In the present study, the authors report on the effect of starvation of rainbow trout on FFA in blood plasma and in white and dark muscle.

Rainbow trout were maintained without food for 1 to 70 days. The concentration of FFA in the blood plasma of the trout averaged 424 (range 160 to 1,003)  $\mu$  equivalents of FFA per liter of plasma. The effect of starvation on the level of FFA in the plasma was limited: the FFA content showed a more significant increase during the first 2 weeks the fish were without food than during the prolonged periods of starvation. The FFA in the lateral line muscle of the trout averaged 147 (range 27 to 258)  $\mu$  equivalents per 100 g. of wet tissue and during starvation of the fish showed a trend similar to that of the FFA in the plasma. Starvation had no effect on the amount of FFA in the white dorsal muscle--the FFA content averaged 37 (range 13 to 73)  $\mu$  equivalents of FFA per 100 g. of wet tissue.

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Abstracter: F. T. Piskur

DEGRADATION OF ORGANOPHOSPHATES BY FISH LIVER PHOSPHATASES

Hogan, James W. (Fish-Pesticide Research Laboratory, Bureau of Sport Fisheries and Wildlife, U.S. Fish and Wildlife Service, Columbia, Missouri), and Charles O. Knowles (Department of Entomology, University of Missouri, Columbia)  
Journal of the Fisheries Research Board of Canada 25, No. 8, 1571-1579 (August 1968)

Inasmuch as fish come in contact with organophosphates (from insecticides), information on the ability of the fish to degrade these toxicants is useful in making assessments of the hazards to fish associated with the use of such chemicals. The present authors, therefore, studied the degradation of several organophosphate compounds *in vitro* by liver of bluegill (Lepomis macrochirus Rafinesque) and of channel catfish (Ictalurus punctatus Walbaum). Chemicals used either as substrates or as inhibitors included N-ethyl maleimide, N-butyl maleimide, *p*-iodobenzoic acid, *p*-chloromercuribenzoic acid, acetylcholine iodide, glycerol tributyrate, cupric chloride, methyl *n*-butyrate, phenyl acetate, phenyl *n*-butyrate, diethyl *p*-nitrophenol phosphate, 2,2-dichlorovinyl dimethyl phosphate, methyl 3-hydroxy- $\alpha$ -crotonate, dimethyl phosphate, and dimethyl 2,2,2-trichloro-1-*n*-butyryloxyethyl phosphonate. The Warburg manometric technique was used for quantitative determination of enzymatic activity. The liver homogenates of bluegill and channel catfish contained soluble enzymes capable of degrading diisopropyl phosphorofluoridate (DFP) and 2,2-dichlorovinyl dimethyl phosphate (DDP). Hydrolysis of these compounds was greatest in the presence of manganic ion. Cleavage of the anhydride bond appears to be the degradation pathway for DFP and DDP *in vitro*. The experiment failed to clearly indicate more than one enzyme hydrolyzing DFP and DDP in the two fish. [2 figures, 5 tables, 20 references]

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Abstracter: F. T. Piskur

DIEL MOVEMENT AND VERTICAL DISTRIBUTION OF  
JUVENILE ANADROMOUS FISH IN TURBINE INTAKES

Long, Clifford W. (Fish-Passage Research Program, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Seattle 98102)

U.S. Fish and Wildlife Service, Fishery Bulletin 66, No. 3, 599-609 (September 1968)

The behavior of fingerling salmonids was measured in turbine intakes of The Dalles and McNary Dams on the Columbia River to aid in developing methods for reducing fish mortality in Kaplan turbines. At The Dalles Dam, diel movement and vertical distribution were sampled at both ends and at the middle of the section of the powerhouse that housed turbines 1 through 12. At McNary Dam, vertical distribution was sampled in intake 12-C, located near the middle of the River channel.

Comparisons of day-night occurrence at The Dalles Dam showed that most chinook salmon (Oncorhynchus tshawytscha), steelhead trout (Salmo gairdneri), and ammocoetes of the Pacific lamprey (Lampetra tridentata) were caught at night (7 p.m. to 7 a.m.). Vertical distribution studies at McNary and The Dalles Dams included catches of sockeye salmon (O. nerka) in addition to the above species. Salmonids were taken at all depths, but most were in the upper 30 percent of water in the intakes (within 4.6 m. of the ceiling). Ammocoetes at The Dalles Dam (no data for McNary Dam) were concentrated near the center and bottom of the intakes; very few were near the ceiling.

To increase survival of fish by manipulating turbine loads during a 24-hour operational period appears feasible. During darkness when fish movements (over)

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Author's abstract



9.17 (Cross Reference: 1.30)

through turbines increase and power demands decrease, the reduction in turbine loads improves the flexibility for adjusting turbine loads to increase fish survival.

The concentration of fingerling salmonids near intake ceilings probably causes most of the fish to pass the turbine runner at or near the hub; therefore, methods for eliminating lethal factors at the runner should be applied first at the hub. In addition, use of deflection and bypass techniques near intake ceilings would be advantageous because the concentration of fish is greatest there. [8 figures, 8 tables, 9 references]

It also has a bibliography and an index.

[Abstracter: L. Baldwin]

# 9.6 A COMPLETE GUIDE TO SEINE NET FISHING

(Cross Ref.: 2.11)

Thomson, David (Department of Fisheries and Marine Technology, University of Rhode Island, Kingston)

The Seine Net -- Its Origin, Evolution and Use, (n.d.) (Fishing News (Books) Ltd.: 100 Fleet Street, London, E.C.4, England) Price £4 6s (plus 5s postage)

Reviewed by John Burgess

Fishing News International 8, No. 5, 118 (May 1969)

The book describes in detail the original Danish method of anchor-dragging, the Scottish method of fly-dragging, and the Japanese method of tow-dragging, as well as all kinds of techniques used by Norwegian and other seine-net fishermen. It has a chapter on seine net gear; one on seiners and their equipment; one on Australian, Canadian, and American modifications of seining gear; and one on the costs and earnings of representative seiners in Denmark, Scotland, and Canada.

[Abstracter: L. Baldwin]

9.11

# RECOVERY OF DEEP SEAWATER AT CONSTANT PRESSURE

## 9.6 MARINE STUDIES

(Cross Ref.: 9.1)

Russell, Frederick S., and Maurice Yonge (eds.)

Advances in Marine Biology Vol. 6 (Academic Press: London and New York [December 1968]) Price 126s; \$17.50

Reviewed by John S. Colman

Nature 222, No. 5188, 60-61 (April 5, 1969)

This volume contains three articles. The first, by Gulland and Carroz, is an account of the need for management of fishery resources. The second, by McNae, deals with the mangrove forests in the Indo-West Pacific and their inhabitants. The last article, by Chirardelli, concerns the chetognaths, or arrow worms.

[Abstracter: F. T. Piskur]

The authors suggest that in fish a direct utilization of fat reserve muscle without the participation of blood stream is an interesting possibility especially in the lateral line muscle, which contains a rich reserve of lipids in conjunction with an active enzyme system for utilization of fat. The mechanism of transport of FFA to fish muscle for utilization is not known, and it is not clear whether the different effect of starvation on FFA levels, in fish and mammals, is due to more fundamental causes or to differences in metabolic rates only.

[3 tables, 33 references]

9.13

# BINDING OF INORGANIC IODIDE TO THE PLASMA PROTEINS OF TELEOST FISHES

Huang, Chau-Ting, and Cleveland P. Hickman, Jr. (Department of Zoology, University of Alberta, Edmonton, Alberta, Canada)

Journal of the Fisheries Research Board of Canada 25, No. 8, 1651-1666 (August 1968)

The purpose of this study was to confirm earlier original work of others on the occurrence and the nature of the iodide-protein interaction among teleost fishes and, additionally, to study the influence of sex, season, pH, and protein acetylation on the iodide-binding capacity of the protein in those species showing the binding phenomenon. Ten fresh-water teleost fishes, 16 marine teleost fishes, 3 elasmobranchs, 1 amphibian, 1 reptile, 1 bird, 2 mammals, and 2 arthropods were studied. The research demonstrated that the iodide-plasma albumin-like protein interaction of the teleost species is nonspecific in nature, is temperature independent, and is weak in binding energy. The interaction is probably an electrostatic attraction. Significant binding existed only in species of the order Clupeiformes (included were *Esox lucius*, northern pike; *Coregonus clupeaformis*, lake whitefish; *Salmo gairdneri*, rainbow trout; and *Thymallus arcticus*, arctic grayling). The binding sites are probably the free cationic groups of basic amino-acid residues on the protein molecules. The binding of iodide was inhibited by  $\text{NO}_3^-$ ,  $\text{SCN}^-$ ,  $\text{ClO}_4^-$ , and  $\text{CCl}_3\text{COO}^-$  but was not affected by thiourea, thiouracil, and other halide ions. [11 figures, 4 tables, 22 references]

[Abstracter: F. T. Piskur]



<p>9.19</p> <p>EFFECTS OF THE INSECTICIDE SEVIN ON SURVIVAL AND GROWTH OF THE COCKLE CLAM <u>GLINOCARDIUM NUTTALLI</u></p> <p>Butler, Jerry A., Raymond E. Millemann, and Nelson E. Stewart (Department of Fisheries and Wildlife, Oregon State University, Marine Science Center, Newport) Journal of the Fisheries Research Board of Canada <u>25</u>, No. 8, 1621-1635 (August 1968)</p> <p>This paper reports on the effects of the insecticide Sevin (1-naphthyl methylcarbamate) and its hydrolytic product, l-naphthol, on the survival, growth, and food consumption of larval and juvenile cockle clams. The clams were tested in sea water at a salinity of 25 parts per thousand and a temperature of 19±2.0° C. They were fed cultures of the unicellular alga <u>Monochrysis lutheri</u>; cell concentrations ranged from 10,000 to 200,000 cells per milliliter of test solution. The toxicant concentration used ranged from 0.1 to 10.0 mg. per liter.</p> <p>Larval clams exposed to Sevin in concentrations of 0.8 mg./l. were dead by Day 7 of the test; those exposed to 0.4 mg./l. showed a reduction in growth by about 15 percent. Sevin was less toxic to juvenile clams than was l-naphthol. l-Naphthol reduced growth of juvenile clams more than Sevin did. Juvenile clams exposed to 1.6 mg./l. of Sevin showed a marked reduction in food consumption.</p> <p>Adult clams exposed to Sevin concentrated the chemical in their tissues--maximum concentrations were reached after 12 hours of exposure. Clams exposed to Sevin at 11° C. concentrated more toxicant than did those exposed at 20° C. The amount of toxicant in the tissues of the clams decreased sharply after the exposed clams had been placed in toxicant-free sea water for 12 hr. The results indicate a need for studies of long-term exposure of animals to sublethal concentrations of pesticides. [2 figures, 6 tables, 21 references]</p> <p>COMMERCIAL FISHERIES ABSTRACTS VOL. 22 NO. 9 PAGE 17 (over) UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</p> <p>Abstracter: F. T. Piskur</p>	<p>9.2</p> <p>FROZEN SEAFOODS PREFERRED TO FRESH BY MAJORITY OF AMERICAN HOUSEHOLDS</p> <p>Anonymous</p> <p>Quick Frozen Foods <u>31</u>, No. 10, 53, 126 (May 1969)</p> <p>The Container Corporation of America and The National Fisheries Institute have recently disclosed the results of a 1-year, in-depth study of seafood preferences in the United States. In the first phase of the study, exploratory interviews were conducted in Boston, Atlanta, Chicago, and San Francisco. From the facts revealed by these interviews, a questionnaire was structured; it was used during a 1,500-household sampling of all ages, incomes, and ethnic and religious groups throughout the Nation. The principal findings are listed below.</p> <ol style="list-style-type: none"> <li>1. One-third of the people interviewed had very definite attitudes about seafoods; two-thirds were neutral. This finding suggests an extensive consumer potential, given the proper marketing conditions. The people who believed that fish is federally inspected had a markedly stronger preference for fish than did those who said they did not know. The surveyors conclude that government inspection fosters positive attitudes toward fish consumption.</li> <li>2. Fin fish were frequently not associated with shellfish--fin fish were thought of as an economical at-home entree, whereas shellfish were considered an expensive delicacy.</li> <li>3. Frozen fish and shellfish were preferred over fresh seafood--by 55 to 40 percent. Consumers between the ages of 35 and 44 indicated the greatest preference for the frozen product, those under 25 being next; the preference declined markedly among consumers over 45 years old, the lowest preference being (over)</li> </ol> <p>COMMERCIAL FISHERIES ABSTRACTS VOL. 22 NO. 9 PAGE 17 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</p> <p>Abstracter: L. Baldwin</p>
<p>9.19</p> <p>THE TOXIC EFFECT OF PENTACHLOROPHENATE, A HERBICIDE, ON FISHERY ORGANISMS IN COASTAL WATERS--V. THE EFFECTS OF LOW SALINITY SEA WATER AND/OR PCP ON <u>TAPES PHILIPPINARUM</u></p> <p>Kobayashi, Kunio, and Takeaki Kurokawa (Lab. Fish. Chem., Fac. Agr. Kyushu Univ., Fukuoka, Japan), and Tetuo Tomiyama (Tokyo Univ. of Fisheries, Tokyo, Japan) Bulletin of the Japanese Society of Scientific Fisheries <u>35</u>, No. 2, 206-210 (February 1969) (In Japanese; figures and summary in English)</p> <p>In 1962, Kobayashi and others found that if the concentration of pentachlorophenate (PCP) that was washed from the paddy fields into the ocean were higher than 0.1 p.p.m., it was lethal to the shellfish <u>Tapes philippinarum</u>. Since sea water of unusually low salinity is also toxic to this shellfish, the authors investigated the relation between the toxic effects of PCP and diluted sea water.</p> <p>The toxic threshold of the shellfish to diluted sea water containing various concentrations of PCP at 25° C. was about 7‰ chlorinity. When the chlorinity was higher than 7‰, the toxicity of the PCP increased as the concentration above 0.1 p.p.m. increased. When chlorinity was lower than 7‰, the toxicity of PCP, even at the 0.3 p.p.m. level, was obscured by the increasing toxicity of the diluted sea water. Preculturing the shellfish in sea water of 5‰ chlorinity had no effect on the toxicity of PCP added to the water at the 0.2 or the 0.3 p.p.m. level.</p> <p>[7 figures, 8 references]</p> <p>COMMERCIAL FISHERIES ABSTRACTS VOL. 22 NO. 9 PAGE 17 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</p> <p>Abstracter: L. Baldwin</p>	<p>9.2</p> <p>MAN &amp; HIS FOOD: 2000 A.D. ECONOMICS, SUPPLY &amp; MORALITY</p> <p>Rasmussen, Clyde L. (Western Utilization R&amp;D Division, Agricultural Research Service, 800 Buchanan Street, Albany, California 94710) Food Technology <u>23</u>, No. 5, 56-58, 61, 64, 67-68, 70, 72, 74 (May 1969)</p> <p>The purpose of the report is to describe the unequal distribution of food in the world, to discuss basic causes of this inequality, and to attempt to estimate food needs up to the year 2000. People on earth exist in two widely different and separate worlds. The affluent have good diets, low birth rates, and consume more than a mathematical share of the world supply of foods and feeds. The less fortunate have poor and inadequate diets, low income, high birth rates, and little trade. Nearly two-thirds of the world population now exists on a standard of nutrition below the acceptable level and three-fourths of the population will do so by the year 2000.</p> <p>Some of the immediate steps to providing good nutrition are: production of more and better foods and distribution to areas of need; reduction of food losses in all steps of distribution, storage, and use; production of foods at lower costs; development and application of supplements to raise the nutritional quality of available food; improvements in ability to buy; and population control. Some essential prerequisites to achieving progress in the various steps are: greater income to provide improved buying power by consumer and to provide savings for investment in production and distribution facilities; education and literacy to take advantage of available knowledge concerning population control, food production, job efficiency; motivation to work, learn, apply, and adapt;</p> <p>COMMERCIAL FISHERIES ABSTRACTS VOL. 22 NO. 9 PAGE 17 (over) UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</p> <p>Abstracter: F. T. Piskur</p>



a favorable governmental climate to provide programs and leadership in the application of technological developments; and the establishment of means to provide capital, technology, education, medical assistance, and food to bridge the gap from present need to self-sufficiency.

[4 figures, 5 tables, 16 references]

The direction of waterflow within a streambed and the interchange of water between the bed and the stream depend primarily on the permeability, depth, and longitudinal profile of the porous streambed. Water upwells where permeability or depth of gravel decreases in the direction of streamflow and where the longitudinal bed profile is concave. Water downwells where permeability or depth of gravel increases in the direction of streamflow or where the longitudinal bed profile is convex. [14 figures, 1 table, 18 references] [Author's abstract]

The chemical quality of intragravel water in streams--the environment of salmon eggs, embryos, and alevins--is influenced by the rate of interchange of stream water and intragravel water. Factors controlling the direction and magnitude of flow or interchange of this water were identified in this study. Equations describing motion of waterflow within the streambed under specified boundary conditions are developed, and tests of the mathematical model with an electrolytic bath analog model are described.

#### INTRAGRAVEL FLOW AND INTERCHANGE OF WATER IN A STREAMBED

Vaux, Walter G. (Biological Laboratory, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, P.O. Box 155, Aniak, Alaska 99821)

U.S. Fish and Wildlife Service, Fishery Bulletin 66, No. 3, 479-489 (September 1968)

9.17 (Cross References: 9.16, 9.19)

(92°C : source) 2.6

in the over-year group. The preference for frozen seafoods increased as the size of the family increased; families of eight or more expressed the most positive preference. Geographically, consumers from the Midwest indicated the strongest preference for frozen seafoods; those from the coastal areas strongly favored fresh seafoods; and those from New Englanders revealed a significantly lower preference for frozen seafoods than did consumers from the Pacific coast. Although non-Jewish families revealed no preference for either fresh or frozen seafoods, Jewish families preferred the fresh varieties.

4. Flavor, quality, and nutrition are the prime factors influencing 70 percent of the purchasers of frozen seafoods; consistency and odor influenced about 50 percent; cost, ease of cooking, and ease of preparation, in that order, were next most influential; thawing speed influenced 28 percent.

5. Packaging was considered very important by 37 percent of the purchasers of frozen seafoods; packaging appeal increased with the age of the consumer, those finding displays most appealing being over 65; only 20 percent of the consumers under 25 considered packaging of any significance. Officials of Container Corporation interpret this situation as a challenge to the industry to improve its communication with the younger market--a well-designed package could be the sole determinant of the brand a consumer buys.

9.19 (Cross Reference: 0.8)

#### HOLOPULPING TO COST CHEMICALS A MARKET

Anonymous  
Chemical and Engineering News 47, No. 21, 30-32 (May 19, 1969)

Holopulping is the first totally new pulping process in nearly a century. In addition to its high yield, versatility, and processing advantages, it minimizes air and water pollution--the first, because the organic materials are burned, producing little besides carbon dioxide and water vapor, and the second, because the countercurrent washing operation keeps liquor dilution and chemical loss low; the remaining calcium sludge waste can be easily disposed of without causing harmful effects in the environment of the stream. [1 table] [Abstract: L. Baldwin]

[unpublished abstract]

1. Baldwin, L. A. (1969) The resistance of the shellfish to low-salinity sea water or to PCP changed with the season. Therefore, the authors conclude, the toxic effects of PCP must be determined during the time when it is used in the fields.

(6661 '6 June) 79-33 '42 . On '77 saws Engineering and Environmental Chemistry

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61.6

9.15 (Cross Reference: 9.19)

#### DDT: HEW SETS TOLERANCE

Anonymous  
Chemical and Engineering News 47, No. 18, 17 (April 28, 1969)

In March 1969, the Food and Drug Administration seized an interstate shipment of coho that had been caught in Lake Michigan because they contained concentrations of DDT ranging up to 19 p.p.m.; no residues of DDT are permissible in fish. Subsequently, the Secretary, U.S. Department of Health, Education and Welfare, set an interim tolerance of 5 p.p.m. for residues of DDT in fish. He also announced formation of a Committee on Pesticides and Their Relationship to Environmental Health. The Committee is to place special emphasis on DDT and other persistent pesticides. The Secretary stated that the time has come to question the continued use of persistent pesticides, to move toward the use of more degradable chemicals for eliminating pests, and to encourage research on development of biological controls.

[Abstract: L. Baldwin]

[Abstract: L. Baldwin]

[7 figures, 8 references]

The resistance of the shellfish to low-salinity sea water or to PCP changed with the season. Therefore, the authors conclude, the toxic effects of PCP must be determined during the time when it is used in the fields.

(Cross Reference: 9.15) 61.6



<div data-bbox="107 1422 154 2091"> <p>9.2 UNITED STATES TARIFFS ON SELECTED ITEMS OF COMMERCIAL FISHING GEAR</p> </div> <div data-bbox="154 1121 246 2091"> <p>Micuta, Jurate E. (Foreign Trade Section, Division of Foreign Trade and Economic Service, Bureau of Commercial Fisheries, 1815 N. Fort Myer Drive, Arlington, Virginia 22209)</p> <p>U.S. Fish and Wildlife Service, Fishery Leaflet 625, 11 pp. (February 1969)</p> </div> <div data-bbox="261 1121 477 2091"> <p>This leaflet has been prepared from Tariff Schedules of the United States Annotated (1969), TC Publication 272. It gives the fishing industry a readily accessible list of tariff rates on fishing equipment. The report has been prepared as a source of information and for statistical purposes. It cannot be considered authority for determining either the proper classification of an item or the rate of duty properly chargeable upon such an item. Questions related to proper classification of commodities for duty purposes should be referred to the Commissioner of Customs, Washington, D.C. 20226, or to the collector of customs or appraiser of merchandise at U.S. ports of entry.</p> <p>The list of equipment in the order of TSUSA classification numbers are in table 1, pages 2 to 8. This list does not necessarily cover all the commercial fishing gear items either inclusively, or exclusively. The rates are for all non-Communist countries.</p> <p>The step reduction rates, as negotiated in the Kennedy Round, are shown in table 2, pages 9 and 10. The six columns shown depict the initial tariff rate changes as negotiated in the Kennedy Round. The "Prior Rate" column shows the (over)</p> </div> <div data-bbox="477 1272 723 2091"> <p>COMMERCIAL FISHERIES ABSTRACTS VOL 22 NO 9 PAGE 19 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</p> <p>Author's introduction</p> </div>	<div data-bbox="107 215 154 1034"> <p>9.6 NUTRIENT REQUIREMENTS OF DOMESTIC ANIMALS. NO. 7 (0.7, 6.19)</p> </div> <div data-bbox="154 21 354 1034"> <p>Anonymous</p> <p>Nutrient Requirements of Domestic Animals, No. 7, Nutrient Requirements of Mink and Foxes, Publication 1676, 46 pp. (First revised edition, n.d.) (Report by the Subcommittee on Furbearer Nutrition, Committee on Animal Nutrition, Agricultural Board, National Research Council) (Available from Printing and Publishing Office, National Academy of Science-National Research Council, 2101 Constitution Avenue, Washington, D.C. 20418) Price \$2.25</p> <p>Reviewed by H. D. Branion</p> <p>Poultry Science 48, No. 1, 359-360 (January 1969)</p> </div> <div data-bbox="369 21 554 1034"> <p>This report replaces Publication 296, Nutrient Requirements of Foxes and Minks, issued in 1953 and is one of a series issued under the direction of the Committee on Animal Nutrition, Agricultural Board, Division of Biology and Agriculture, National Research Council. The present report reflects changes that have since occurred in husbandry practices and in choice of diet ingredients. The metric system is used. Names of feeds are in accordance with the nomenclature adopted by the Committee on Animal Nutrition (United States) and the National Committee on Animal Nutrition (Canada).</p> </div> <div data-bbox="569 21 662 1034"> <p>Nutrient requirements expressed in percentage of dietary dry matter or amount per kilogram of dry matter fed are shown in table 1 for mink and table 2 for foxes. Daily nutrient requirements per male or female for growth are in table 3 for mink (over)</p> </div> <div data-bbox="677 129 723 1034"> <p>COMMERCIAL FISHERIES ABSTRACTS VOL 22 NO 9 PAGE 19 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</p> <p>Abstracter: F. T. Piskur</p> </div>
<div data-bbox="754 1466 800 2091"> <p>9.6 UNDERWATER SCIENCE AND TECHNOLOGY (Cross Ref.: 9.11) INFORMATION BULLETIN -- PILOT ISSUE</p> </div> <div data-bbox="800 1121 877 2091"> <p>Anonymous</p> <p>Information Bulletin, Pilot Issue, 22 pp. + iii (February 1969) (Iliffe-NTP Inc., 300 East 42nd Street, New York, N.Y. 10017)</p> </div> <div data-bbox="893 1121 1309 2091"> <p>Two new publications on underwater science and technology are to be issued early this year by Iliffe Science and Technology Publications Ltd., Iliffe House, 32 High Street, Guildford, Surrey, England. The first, "Underwater Science and Technology Information Bulletin," appeared in March 1969 and will be issued monthly. It is a comprehensive reference source of scientific and technological information on all aspects of applied research and development in the underwater environment. It contains two principal sections--(1) Citations and (2) Patents Abstracts. The Citation section is grouped in 15 broad categories dealing with marine biology; biological resources; nonbiological resources; geology and geophysics; hydrography and topography; meteorology and hydrology; oceanography; diving; engineering and structures; transportation, surface vessels, submersibles, and vehicle systems; instrumentation and equipment; navigation and communication; pollution; policy, administration, and legislation; and general reviews and miscellaneous articles. The Patents Abstracts section will contain the details of the patents directly or indirectly related to underwater science and technology. Other sections will deal with equipment and instrumentation, new books, and forthcoming events. The annual subscription price is £14 (\$35.00 overseas).</p> <p>The second publication, "Underwater Science and Technology Journal," will complement the Information Bulletin and will be issued quarterly starting May 1969.</p> </div> <div data-bbox="1309 1228 1355 2091"> <p>COMMERCIAL FISHERIES ABSTRACTS VOL 22 NO 9 PAGE 19 (over) UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</p> <p>Abstracter: F. T. Piskur</p> </div>	<div data-bbox="754 344 800 1034"> <p>9.7 MODIFICATION OF DISSEMINATION CHANNELS FOR SCIENTIFIC INFORMATION</p> </div> <div data-bbox="800 21 908 1034"> <p>Rossmassler, Stephen A. (Office of Standard Reference Data, Institute for Basic Standards, National Bureau of Standards, Washington, D.C. 20234)</p> <p>Journal of Chemical Documentation 9, No. 1, 17-19 (February 1969) (American Chemical Society Publications, 1155 Sixteenth St., N.W., Washington, D.C. 20036)</p> </div> <div data-bbox="924 21 1124 1034"> <p>Traditional channels for dissemination of scientific information are designed primarily to meet the author's requirements and are document-oriented. They are based on primary publication of the information in a scientific journal and the providing of reader guidance by an abstract journal. Because of the tremendous growth of scientific information, a redesign of the technical literature is needed. The author proposes that the single piece of technical information be recognized as the unit of flow into the distribution system. Writing, refereeing, publishing, indexing, abstracting, and distributing the whole document are no longer sufficient. The proposed modified dissemination channel would be:</p> </div> <div data-bbox="1124 323 1324 1034"> <pre> Originator of information               +----- Primary publication -----&gt; Abstract journal               +----- Information Analyses Center -----&gt;               +----- Specialized Compilation of Information -----&gt;               +----- User -----&gt; User (over)     </pre> </div> <div data-bbox="1309 150 1355 1034"> <p>COMMERCIAL FISHERIES ABSTRACTS VOL 22 NO 9 PAGE 19 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</p> <p>Abstracter: F. T. Piskur</p> </div>



# COMPUTER METHODS FOR ANALYSTS

(Cross Ref.: 7.0)

Dyrssen, David, Daniel Jagner, and Fredrik Wengelin

Computer Calculation of Ionic Equilibria and Titration Procedures, 250 pp. (Almqvist and Wiksell, Stockholm; Wiley, New York and London [January 1969])

Price 85s

Reviewed by T. S. West  
Nature 222, No. 5188, 52 (April 5, 1969)

Often in the area of analytical chemistry, calculations based on measurements made by titration become tedious and protracted because of the complicated equilibria involved. This book deals specifically with these types of problems and is designed to permit analytical and inorganic chemists to make use of computer programming to solve such problems without detailed knowledge of the functioning of a computer.

[Abstract: F. T. Piskur]

...of the book is a practical guide for the boatbuilder. It also contains information on the characteristics of the concrete used in boatbuilding and a brief history of the use of such concrete in boatbuilding. [Abstract: F. T. Piskur]

## FERRO-CEMENT GETS FINE TREATMENT (2.11) IN NEW ZEALANDER'S DETAILED BOOK

Jackson, Gairnor W., Jr., and W. Morley Sutherland  
Concrete Boatbuilding, Its Technique and Its Nature, 106 pp. (George Allen and Unwin Ltd., London [1969]) Price 45s net

Reviewed by John Gardner  
National Fisherman 50, No. 1, 8A-9A, 22A (April 1969)

The book is a practical guide for the boatbuilder. It also contains information on the characteristics of the concrete used in boatbuilding and a brief history of the use of such concrete in boatbuilding. [Abstract: F. T. Piskur]

[Abstract: F. T. Piskur]

...of the book is a practical guide for the boatbuilder. It also contains information on the characteristics of the concrete used in boatbuilding and a brief history of the use of such concrete in boatbuilding. [Abstract: F. T. Piskur]

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...of the book is a practical guide for the boatbuilder. It also contains information on the characteristics of the concrete used in boatbuilding and a brief history of the use of such concrete in boatbuilding. [Abstract: F. T. Piskur]

Such a system offers the possibility of making changes for further consideration practices. The author proposes three possible changes for further consideration.

## 9.12 (Cross References: 1.85, 9.2)

### MORTALITY RATES IN POPULATIONS OF PINK SHRIMP, *PENAEUS DUORARUM*, ON THE SANIBEL AND TORTUGAS GROUNDS, FLORIDA

Costello, T. J., and Donald M. Allen, (Biological Station, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Miami, Florida 33149)  
U.S. Fish and Wildlife Service, Fishery Bulletin 66, No. 3, 491-502 (September 1968)

Mark-recovery experiments were made to obtain estimates of fishing and natural mortalities as a portion of studies related to the life history of commercial shrimps in the Gulf of Mexico. In two experiments, groups of pink shrimp were injected with biological stains and released into the Sanibel and Tortugas fisheries off the southwest coast of Florida. Marked shrimp were recaptured by commercial shrimp fishermen.

Mortality estimates were derived from analysis of marked shrimp recoveries during the first 10 and 8 weeks of the Sanibel and Tortugas experiments, respectively. In the Sanibel population, fishing mortality was estimated to have been 6.8 percent for each 2-week period, and all other losses in the population were 14.8 percent; for the Tortugas population, fishing mortality was estimated to have been 13.1 percent for each 2-week period, and all other losses 19.7 percent. [8 figures, 6 tables, 28 references]

[Authors' abstract]

...of the book is a practical guide for the boatbuilder. It also contains information on the characteristics of the concrete used in boatbuilding and a brief history of the use of such concrete in boatbuilding. [Abstract: F. T. Piskur]

## 9.6 THE UNDERWATER ASSOCIATION REPORT 1968 (Cross Ref.: 9.11)

Underwater Association of Malta  
Iliffe Science and Technology Publications Ltd.

The Underwater Association of Malta was formed in 1965 to promote and develop underwater scientific research. One of the Association's major contributions to the advance of underwater science is its annual symposium, at which scientific papers concerned with original research undertaken by its members and invited speakers are presented and discussed.

The Association's third symposium was held in March 1968 at the London Zoological Society's headquarters in Regents Park. Eighteen papers were delivered at this symposium, which covered a wide range of underwater research carried out in such scientific disciplines as archaeological surveying, physical oceanography, marine geology, psychology, physiology, zoology, and botany.

The proceedings of this symposium--titled the Underwater Association Report 1968--have now been published on behalf of the Association by Iliffe Science and Technology Publications Ltd.

The proceedings of the two previous symposia held by the Underwater Association are also available from Iliffe Science and Technology Publications Ltd., Iliffe House, 32 High Street, Guildford, Surrey, England.

[From publisher's brochure]

...of the book is a practical guide for the boatbuilder. It also contains information on the characteristics of the concrete used in boatbuilding and a brief history of the use of such concrete in boatbuilding. [Abstract: F. T. Piskur]

...of the book is a practical guide for the boatbuilder. It also contains information on the characteristics of the concrete used in boatbuilding and a brief history of the use of such concrete in boatbuilding. [Abstract: F. T. Piskur]

Such a system offers the possibility of making changes for further consideration practices. The author proposes three possible changes for further consideration.



## EVIDENCE FOR THE EXISTENCE OF A MINIMUM OF TWO PHASES OF ORDERED WATER IN SKELETAL MUSCLE

Hazlewood, C. F., and B. L. Nichols (Department of Pediatrics, and Department of Physiology, Baylor College of Medicine, and Texas Children's Hospital, Houston, Texas 77025) and N. F. Chamberlain (Esso Research and Engineering Company, Baytown, Texas 77520)  
Nature 222, No. 5195, 747-750 (May 24, 1969)

Evidence points to the major influence that macromolecules such as proteins can have on the properties of cellular water. In 1958, Klotz supported Szent-Györgyi's suggestion, made in 1957, that water molecules surrounding proteins are in an ice-like state. Other investigators have shown that water molecules near biological macromolecules may be in a state different from that of pure water. This finding seems to apply particularly to skeletal muscle and to peripheral nerve. Using nuclear magnetic resonance (NMR) spectroscopy to study the state of water in muscle tissue, the authors found that muscle water exists in at least two ordered phases. These phases can be distinguished by the difference in the width of their NMR signals, by deuterium exchange, and by vacuum drying; heat denaturation of the muscle protein lessens the degree of ordering. Most of the water in muscle is devoted to confirming the existence of at least a major and a minor phase of ordered water in muscle. [Abstract: L. T. F. Piskur]

COMMERCIAL FISHERIES ABSTRACTS VOL. 22 NO. 9 PAGE 12  
UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE

## STUDIES OF BUTTERFAT AS RELATED TO HUMAN NUTRITION

Gaster, W. O. (University of Georgia, Athens)  
Food Product Development 3, No. 3, 23, 26, 28, 59 (May 1969)

In the first part of the article, the author discusses the lack of clear goals in the field of human nutrition, the pattern of nutrition research in the laboratory, and fatty acid metabolism. In the rest of the article, he reviews the work carried out in his laboratory on the physiological and biological effects of feeding fatty acids to rats. These studies have been published elsewhere. The conclusions the author draws from the various studies are: (1) although linoleic acid is probably about 1 to 4 percent of the calories, linoleate in the diet in amounts greater than 7 percent may have undesirable effects. The various saturated fatty acids show different metabolic effects. [Abstract: L. T. F. Piskur]

[Abstract: L. T. F. Piskur]  
Foods are cooked in a bath. The cooking time is automatically controlled by a mechanism that senses the changes in temperature in the bath material adjacent to the food.  
Food Technology 23, No. 5, 52 (May 1969)

2.8  
COOKING METHOD  
U.S. Patent 3,423,210  
Martino, L. J. (pat.)  
McDonald's System, Inc.  
Food Technology 23, No. 5, 52 (May 1969)

## 2.8 COOKING METHOD

COMMERCIAL FISHERIES ABSTRACTS VOL. 22 NO. 6 PAGE 12  
UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE

## PROTECTING OUR FOODS FROM ENVIRONMENTAL INTRUSION

## 3. MYCOTOXINS AND OTHER PLANT POISONS

Wilson, Benjamin J. (Division of Toxicology, School of Medicine, Vanderbilt University, Nashville, Tennessee 37203)  
Food Technology 23, No. 6, 70, 72, 74, 76-77 (June 1969)

Some plants form metabolic products that may have detrimental effects when consumed by man and animals. These organisms include bacteria, fungi, algae, and certain higher plants. The author discusses briefly (1) the mycotoxins (toxic metabolites of fungus) from ergot, mushrooms, and filamentous fungi, (2) the aflatoxins produced by the *Aspergillus flavus* group of molds, (3) toxins from other molds, (4) phycotoxins from *Convaux* catenella and other algae, and (5) the toxins from higher plants such as *Jimsonweed*. [Abstract: F. T. Piskur]

[2 figures, 3 tables, 14 references]  
The authors discuss the principles of spectrophotometry and gonidophotometry and the application of various commercially available instruments for color measurements of foods. [7 figures, 7 references] [Abstract: F. T. Piskur]

Francis, F. J., and F. M. Clydesdale (Department of Food Science and Technology, University of Massachusetts, Amherst)  
Food Product Development 3, No. 3, 30, 34, 36, 38, 40, 68 (May 1969)

## 0.112 COLOR MEASUREMENT OF FOODS: XI. SPECTROPHOTOMETRY AND GONIDOPHOTOMETRY

COMMERCIAL FISHERIES ABSTRACTS VOL. 22 NO. 6 PAGE 12  
UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE

(Cross Reference: 1.87)

## FREEZING LOBSTERS

British Patent 1,140,960  
Roy Clouston and Sons, Ltd., Montreal, Quebec, Canada  
Modern Refrigeration and Air Conditioning 27, No. 854, 18 (May 1969)

Frozen lobsters, being very brittle, are likely to disintegrate during handling. The lobsters are first held in boiling water. To prevent breakage, they are then placed in shaped containers that hold them firmly in shape during freezing. Finally, they are packed in clear, heat-shrinkable material.

[Abstract: L. Baldwin]

Dried additives are mixed with masses of cooked foodstuff containing voids. The material is sealed in a container and frozen.

U.S. Patent 3,415,664  
Montgomery, F. D., and F. Dorsey Montgomery (pat.)  
Food Technology 23, No. 5, 52 (May 1969)

3.2349 FREEZING PROCESS

COMMERCIAL FISHERIES ABSTRACTS VOL. 22 NO. 6 PAGE 12  
UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE



<p>0.7</p> <p>PROTEIN VALUE OF COD AND COALFISH AND SOME PRODUCTS FOR THE YOUNG RAT</p> <p>Njaa, L. R., F. Utne, and O. R. Braekkan Fiskeridirektoratets Skrifter Serie Teknologiske Undersøkelser 5, No. 4, 1-13 (1968)</p> <p>World Fisheries Abstracts 20, No. 1, 46 (January-March 1969)</p> <p>The protein quality of cod muscle protein and of some products of cod and coalfish was determined in nitrogen balance experiments with young rats. In most of the experiments spray dried egg albumin was used as a standard of reference. All the fish proteins showed a lower utilization than egg albumin, but the results indicated that the preparations tested had high biological values.</p> <p>There was no appreciable difference between raw cod fillets, acetone dried cod fillets, or acetone dried fillets which had been boiled before drying. Two pilot plant fish flours from cod fillet waste showed high biological values.</p> <p>There was no difference in the utilization values between freeze dried coalfish fillet pastes containing different amounts of residual bones. Stockfish flours showed utilization values of about the same magnitude as the acetone dried fillets.</p> <p>There was no difference in the utilization values for stockfish and paste made from stockfish soaked in NaOH or NaCO<sub>3</sub> ("lutefisk"). A comparison between acetone dried cod and herring fillets and meat from porbeagle and basking shark showed the elasmobranchs to be less well utilized than the teleosts.</p> <p>[Reprinted]</p>	<p>3.236</p> <p>PROBLEM OF "GREEN" FROZEN RAW BREADED SHRIMP</p> <p>Thompson, Mary H., and Robert N. Farragut (Technological Laboratory, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, P.O. Drawer 1207, Pascagoula, Mississippi 39567)</p> <p>Fishery Industrial Research 5, No. 1, 1-10 (May 1969)</p> <p>A green coloration has appeared sporadically on frozen raw breaded shrimp. Reported here are the results of a study made to determine the cause of the green coloration and to find a method of avoiding it. The study indicated that the coloration was caused by airborne metallic particles and that eliminating the particles from contact with the product would therefore solve the problem.</p> <p>[1 figure, 7 tables] [Reprinted in part]</p> <p>-----</p> <p>[Abstracter: F. T. Pliskur]</p> <p>-----</p> <p>3.235</p> <p>(Cross Reference: 3.236)</p> <p>FRIED FISH PRODUCT</p> <p>German Patent 1,284,271 Plange, Fa. George (pat.) Food Technology 23, No. 5, 47 (May 1969)</p> <p>The apparent "fishy" odor of fried fish products is reduced by use of bread- ing mixture containing flour, citric acid, ground mustard, onion powder, and coffee.</p> <p>[Abstracter: F. T. Pliskur]</p> <p>-----</p> <p>4.31</p> <p>(Cross Reference: 9.12)</p> <p>MIGRATION AND DISTRIBUTION OF PINK SALMON SPAWNERS IN SASHIN CREEK IN 1965, AND SURVIVAL OF THEIR PROGENY</p> <p>McNeil, William J. Pacific Fisheries Laboratory, Oregon State University, Marine Science Center, Newport 97365)</p> <p>U.S. Fish and Wildlife Service, Fishery Bulletin 66, No. 3, 575-586 (September 1968)</p> <p>The escapement of 813 pink salmon (<i>Oncorhynchus gorbuscha</i>) to Sashin Creek southeastern Alaska, in 1965, followed by the emergence of 2.2 million fry, or 18 percent of the potential egg deposition, represented a relatively high survival of eggs and alevins in a stream, where the long-term average is 7 percent. This high survival was predicted from an established relation between survival of eggs and alevins and the time the parents entered Sashin Creek to spawn.</p> <p>The spawning ground was divided into three areas--upper, middle, and lower--to study density of spawners and survival of their progeny. Density in 1965 was higher in the middle and upper areas than in the lower. From egg deposition to fry emergence, survival was estimated to be 23 percent in the upper area, 18 percent in the middle area, and 14 percent in the lower area.</p> <p>The instantaneous rate of mortality remained relatively unchanged from de- position of eggs to emergence of fry in the upper and middle areas. In the lower area, mortality was relatively high during spawning and low between spawning and hatching of eggs. Much of the mortality throughout the stream was traced to the disappearance of eggs and alevins. Factors causing this disappearance included retention of eggs, superimposition of redds, predation, and turbulent water. A drought during spawning retarded development of embryos and caused considerable mortality.</p> <p>[2 figures, 12 tables, 41 references] [Author's abstract]</p>
<p>5.0</p> <p>STUDIES ON THE MARINE MICROORGANISMS UTILIZING INORGANIC NITROGEN COMPOUNDS. II. ON THE MARINE HETEROTROPHIC BACTERIA ASSIMILATING INORGANIC NITROGEN COMPOUNDS</p> <p>Kimata, Masao, Yoichi Yoshida, and Michiko Taniguchi (Dept. Fish., Fac. Agr., Kyoto Univ., Maizuru, Japan)</p> <p>Bulletin of the Japanese Society of Scientific Fisheries 35, No. 2, 211-214, (February 1969) (In Japanese; tables and summary in English)</p> <p>The authors investigated the distribution of marine heterotrophic bacteria assimilating inorganic nitrogen compounds in Maizuru Bay and clarified the methods of counting and classifying them. The bacteria were found to be comparatively numerous in bottom muds and in sea water, from 10<sup>3</sup> to 10<sup>5</sup> cells per gram and from 10<sup>0</sup> to 10<sup>2</sup> cells per milliliter, respectively. Bacteria that assimilate NH<sub>3</sub>-N, NO<sub>2</sub>-N, constituting from 2 to 40 percent and from 0 to 20 percent, respectively, of the total heterotrophic bacterial count; the percentage of these bacteria was smaller in the sea water than in the bottom mud.</p> <p>[Tables, 5 references]</p> <p>[Abstracter: F. T. Pliskur]</p>	<p>2.3</p> <p>SHRIMP PROCESSING</p> <p>U.S. Patent 3,423,788 Lapeyre, F. S. (pat.) The Laitram Corp. Food Technology 23, No. 6, 56 (June 1969)</p> <p>The apparatus is used for breaking shell segments of shrimp: one segment is held while the adjacent segment is moved about a fulcrum.</p> <p>[Abstracter: F. T. Pliskur]</p>



<div data-bbox="77 32 154 1067"> <div>6.249</div> <div>BEITRAG ZUR PRÜFUNG VON BEDARFSGEGENSTÄNDEN AUS PLASTEN (TESTING OF UTENSILS OF PLASTICS)</div> </div> <div data-bbox="154 32 446 1067"> <div>Woggon, H., U. Kohler, and W. J. Uhde Deutsche Lebensmittel Rundschau 64, No. 8, 243-247 (1968) Food Science Abstracts 2, No. 12, Abstr.:68/1759, 624 (December 1968)</div> <div>The possibility of contamination of foodstuffs by cadmium compounds leached from plastic materials in contact with the food is discussed. The cadmium compounds may be present in the plastic material, for example, polyethylene, polystyrene or polyamides, as pigments when the plastic material is used for the production of utensils. Methods for determining the quantity of cadmium compound in the foodstuff are given. The results show that little pigment migrates from polyethylene or polystyrene but higher amounts were leached from certain polyamides. [11 references] [Reprinted]</div> </div>	<div data-bbox="77 1067 154 2145"> <div>3.336</div> <div>CANNING PROCESS</div> </div> <div data-bbox="154 1067 446 2145"> <div>British Patent 1,135,240 Cryodry Corp. Food Technology 23, No. 5, 52 (May 1969)</div> <div>Food is heated by microwaves and sealed in containers while in a sterile environment. [Abstract: F. T. Piskur]</div> </div>
<div data-bbox="746 32 823 1067"> <div>6.15</div> <div>GROWTH PROMOTERS</div> </div> <div data-bbox="823 32 1093 1067"> <div>U.S. Patent 3,421,900 Stephenson, H. L. (pat.) Food Technology 23, No. 6, 62 (June 1969)</div> <div>Condensed fish solubles are dialyzed. The dialyzate is subjected to electrophoresis, and certain fractions from the anode side are fractionally crystallized from acetone or methanol. These substances promote growth when fed to chicks. [Abstract: F. T. Piskur]</div> </div>	<div data-bbox="746 1067 823 2145"> <div>3.336</div> <div>FISH PACKING APPARATUS</div> </div> <div data-bbox="823 1067 1093 2145"> <div>Canadian Patent 803,854 Garruthers, E. H. (pat.) Food Technology 23, No. 5, 47 (May 1969)</div> <div>Fish are compressed to a constant volume in a filling chamber. The contents of the chamber are then transferred to containers. [Abstract: F. T. Piskur]</div> </div>
<div data-bbox="1093 32 1170 1067"> <div>6.59</div> <div>METHOD OF TREATMENT OF CRUDE ANIMAL FAT</div> </div> <div data-bbox="1170 32 1378 1067"> <div>U.S. Patent 3,424,587 Mayer, Alois (pat.) National Provisioner 160, No. 21, 20 (May 24, 1969)</div> <div>Animal-feed concentrates are made from crude animal fats by drying, comminuting, freezing, and pulverizing the fats and then incorporating salt and other additives. [Copies of the complete patent are available for \$2 each (\$3 outside the United States) from the Editorial Department, The National Provisioner, 15 W. Huron Street, Chicago, Illinois 60610.] [Abstract: L. Baldwin]</div> </div>	<div data-bbox="1093 1067 1170 2145"> <div>3.9</div> <div>(Cross Reference: 1.0144)</div> </div> <div data-bbox="1170 1067 1378 2145"> <div>ENSILING FOR CHEAP STORING OF FISH TESTED IN SWEDEN</div> <div>Anonymous Fishing Gazette 86, No. 4, 52 (April 1969)</div> <div>The Microbiological Institute at Sweden's Ultuna Agricultural College is testing a new inexpensive method of preserving fish that could be of great importance to developing countries in the tropics. The method has been labeled "The Prevention of Clostridium Botulinum Type E Poisoning and Fat Rancidity by Silage Fermentation." It is easy to learn, teach, and use, for exact measurements or qualified personnel are not necessary. It works as follows: fresh fish are ground, 20 percent starch and other ingredients are added, and the whole mixture is put in a silo. The bacteria from the starch cause extremely fast lactic acid fermentation, which preserves the fish for at least 3 months no matter how hot the weather may be.</div> <div>The primary advantage of ensiling fish is that expensive apparatus is not required; only a grinder and a container are needed--a silo, a barrel, or a strong plastic bag. The Institute has made a film demonstrating the techniques of the method. [Abstract: L. Baldwin]</div> </div>



## STATION EXPERIMENTS WITH CATFISH BYPRODUCT

6.51

Anonymous  
Feedstuffs 41, No. 19, 38 (May 10, 1969)

The article reports on the experimental preparation of ground meal from the waste (head, skin, and viscera) from a channel catfish processing plant. A batch process was used. Total yield was 570 lb. of dried scrap and 310 lb. of oil from 2,724 lb. of wet waste. Composition data are as follows:

Item	Moisture Percent	Total Solids Percent	Fat Percent	Ash Percent	Protein Percent	The oil contained: water 0.9, insoluble impurities 9.45, un- saponifiable matter 0.69, and free fatty acids 4.7 percent.
Wet waste	64	36	40	15.3	35.6	
Dried scrap	6.2	93.8	20.1	23.2	46.8	
Meal						

[Abstracter: F. T. Piskur]

Fishery byproducts are mixed with nitrite salts, and the material is oxidized to remove unsaturated fatty acids.  
[Abstracter: F. T. Piskur]

## OXIDATION OF BY-PRODUCTS

6.50

Japanese Patent 24937/68

Arakawa, S., and S. Tomimaga (pat.)  
Food Technology 23, No. 5, 52 (May 1969)

## DEACIDIFYING OILS

6.1319

U.S. Patent 3,419,588

De Man, W. (pat.)

Lever Bros. Co.

Food Technology 23, No. 5, 48 (May 1969)

Thin flowing layers of glyceride oils are sprayed with aqueous alkaline liquids. The oil and liquid are maintained in concurrent, non-turbulent flow until the free fatty acids are neutralized.  
[Abstracter: F. T. Piskur]

## OIL REFINING

6.1310

U.S. Patent 3,423,442

Eichler, F., P. J. Seip, and P. Czedit-Eysenberg (pat.)

Lever Bros. Co.

Food Technology 23, No. 5, 48 (May 1969)

Glyceride oils are treated with aqueous liquids in beds of chemically inert packing material.  
[Abstracter: F. T. Piskur]

A citrus oil is added in amounts of up to 1,000 p.p.m. to fats to reduce the objectionable volatile odors that arise when the fats are used for frying purposes.  
[Abstracter: F. T. Piskur]

## COOKING FATS

6.135

British Patent 1,135,609

Unilever Ltd.

Food Technology 23, No. 5, 48 (May 1969)

## TEST METHODS FOR INSULATED VEHICLE BODIES AND CONTAINERS

3.25

Serine, G. R. (Shipowners' Refrigerated Cargo Research Association, Cambridge, England)

Modern Refrigeration and Air Conditioning 72, No. 852, 67-69, 85 (March 1969)

Any insulated container or vehicle body should isolate the load from the outside environment, maintaining it in a condition unaffected by wind, weather, and the movement of the vehicle. This article discusses the factors that govern the degree of isolation possible in an insulated container and the different ways of measuring the amount of heat leakage to be expected under a given set of conditions.  
[Abstracter: L. Baldwin]

## FROZEN FISH THAWING

6.1319

British Patent 1,136,541

National Research Dev. Corp.

Food Technology 23, No. 5, 47 (May 1969)

Fish are thawed by electrical resistance heating employing electrode plates. A coolant is circulated through the electrode plates to prevent localized thermal damage to the fish.  
[Abstracter: F. T. Piskur]

## RENDERING PROCESS

6.130

Japanese Patent 24149/68

Rebin, E. (pat.)  
Food Technology 23, No. 5, 52 (May 1969)

Fish tissue is dehydrated then extracted with a water-insoluble solvent.  
[Abstracter: F. T. Piskur]

Foodstuffs are smoked by use of a smoke-producing tablet prepared from beech [unipiper needles] and wood or stems.  
[Abstracter: F. T. Piskur]

Food Technology 23, No. 5, 52 (May 1969)

British Patent 1,137,072

Brumendorf, Ludwig (pat.)

Food Technology 23, No. 5, 52 (May 1969)

A smoked-flavor fluid is prepared by thermally decomposing particulate wood solids by direct contact with superheated steam.  
[Abstracter: F. T. Piskur]

Food Technology 23, No. 6, 60 (June 1969)

British Patent 1,137,636 and British Patent 1,137,637

Fessman, Gerhard (pat.)

Food Technology 23, No. 6, 60 (June 1969)

3.4



Reference standards for vitamins A, E, and K<sub>1</sub>, and for yolk pigmentation have been prepared by the ANRC (Animal Nutrition Research Council) for distribution by the U.S. Pharmacopoeial Convention Inc. The standards are in the form of free-flowing gelatin-stabilized beadlets suitable for preparation of uniform diet mixtures that retain full potency well beyond the time limits of the test period. A description of the reference standard is as follows:

Reference standard	Material	Potency
Vitamin A	a solution of all-trans vitamin A acetate in cottonseed oil	10,000 USP units per gram
Vitamin E	dl- $\alpha$ -tocopheryl acetate	50 IU per gram
Vitamin K <sub>1</sub>	2-methyl-3-phytyl-1,4-naphthoquinone (phytonadione, USP)	10 mg. per gram
Yolk pigmentation	8- $\alpha$ -apo-8'-carotenal	100 mg. per gram

All standards may be obtained from U.S. Pharmacopoeia Reference Standards, 4630 Montgomery Ave., Bethesda, Maryland 20014. [Abstract: F. T. Piskur]

7.54

IMPROVED SEPARATION OF STEROLS BY REVERSED-PHASE THIN-LAYER CHROMATOGRAPHY

De Souza, Noel J., and William R. Nes (Department of Biological Sciences, Drexel Institute of Technology, Philadelphia, Pennsylvania 19104)  
Journal of Lipids 10, No. 2, 240-243 (March 1969)

Some closely related sterols were separated on the basis of carbon number and the number and location of double bonds through the use of paraffin-impregnated kieselguhr chromatoplates in the system (paraffin oil)/(acetone-water 4:1). [5 figures, 1 table, 19 references] [Abstract: F. T. Piskur]

Trimethylamine N-oxide is added to the raw fish during the processing of the fish paste product. [Abstract: F. T. Piskur]

FISH PASTE PRODUCT

Japanese Patent 784/69  
Ajinomoto Co. Inc.  
Food Technology 23, No. 6, 56 (June 1969)

The fish product is prepared from the ovaries of Atlantic or North Sea herring. [Abstract: F. T. Piskur]

Rice, T. R. (Radiobiological Laboratory, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Pivers Island, Beaufort, North Carolina 28516)  
U.S. Fish and Wildlife Service, Circular 309, 59 pp. (April 1969)

Radioecological research at the Bureau of Commercial Fisheries Radiobiological Laboratory is concerned with three general problems: (1) the fate of radioactive materials in the estuarine environment, (2) the effect of radiation on marine organisms, and (3) the application of radioactive tracer techniques to fishery biology. To obtain the data pertinent to these problems, three approaches have been used: (1) in the past we have collected many data in the laboratory to enable us to predict the fate of radioactive materials introduced into the marine environment; (2) more recently we have used tanks and ponds to test questionable findings obtained in the laboratory; and (3) we are now observing the cycling of radioisotopes in certain natural bodies of water, restricting from the public (some such studies have been completed). We believe that data collected by these three approaches, when integrated and correlated, will make for a better understanding of the role of plants and animals in the cycling of radioactivity in estuaries and marine areas. At the present time, this research is being carried out under the following four programs: Estuarine Ecology, Biogeochemistry, Pollution Studies, and Radiation Effects. In addition to the radioecological research, pesticide research is also a responsibility. [32 figures, 12 tables, 15 cited publications] [Author's introduction]

9.6

NOVEL PROTEINS

(Cross Ref.: 6.34, 6.54)  
Mateles, R. I., and S. R. Tannenbaum (eds.)  
Single-Cell Proteins, ix + 480 pp. (MIT Press: Cambridge, Mass. and London, England [February 1969]) Price 149s  
Reviewed by N. W. Pirie  
Nature 222, No. 5188, 57-58 (April 5, 1969)

The book contains 36 papers dealing with the broadly interpreted subject of single-cell proteins. The various papers concern the use of fungi, yeasts, bacteria, leaf protein, seed protein, and algae as food for human consumption. Several case studies involving the introduction of novelty foods are presented. [This section should be of interest to those contemplating the introduction of fish protein concentrate.] In one paper, Bacigalupo from Peru stresses the importance of thorough and sustained preliminary work in private before any attempt is made to introduce the new food in public. He also stressed the foolishness of introducing the new food to the less privileged members of a community: without prestige, a new food can not succeed.

Dimino describes the success in making and marketing "Incaparina" in Columbia. He states that some of the prerequisites for success are a local source of raw material, a cooperative local government, and an enthusiastic local staff. He states further that the investment in plant and equipment is far less significant than the outlay for the marketing function. [Abstract: F. T. Piskur]



<p>9.19 DDT RESIDUES ABSORBED FROM ORGANIC DETRITUS BY FIDDLER CRABS</p> <p>Odum, W. E., (Institute of Marine Sciences, University of Miami, Florida 33149), G. M. Woodwell (Biology Department, Brookhaven National Laboratory, Upton, New York 11973), and C. F. Wurster (Department of Biological Sciences, State University of New York, Stony Brook 11790)</p> <p>Science <u>164</u>, No. 3879, 576-577 (May 2, 1969)</p> <p>DDT (1,1,1-trichloro-2,2-bis(p-chlorophenyl)ethane) and its metabolites accumulate in organic plant detritus within estuaries and may remain there for many years. The pesticide residues appear to be most abundantly associated with particles having diameters from 250 to 1,000 microns. Organic detritus particles of such size are ingested by many organisms, and the DDT residues associated with the particulates may enter diverse food chains. The present authors fed fiddler crabs, <i>Uca pugnax</i>, natural detritus containing 10 p.p.m. of DDT residues during an 11-day experiment. On the 11th day, the crabs were killed and the muscles of the large claw were analyzed for DDT residues (DDT, DDE, and DDD). Controls (untreated) showed no change in residue concentration (0.240 p.p.m.). The DDT residues in the claws of the crabs fed contaminated detritus were 0.885 p.p.m. (34 percent DDT, 58 percent DDE, and 8 percent DDD), representing a threefold increase. Also, all the experimental fiddler crabs (those fed natural detritus containing DDT residues) developed poor coordination by the 5th day of the test. [1 figure, 17 references]</p> <p>[Abstracter: F. T. Piskur]</p>	<p>9.6 THE FREEZING PRESERVATION OF FOODS VOL. 3. (Cross Ref.: 3.2) COMMERCIAL FREEZING OF FRESH FOODS</p> <p>Tressler, D. K., W. B. Van Arsdel, and M. J. Copley (eds.)</p> <p>The Freezing Preservation of Foods Vol. 3. Commercial Freezing of Fresh Foods, 486 pp. (The Avi Publishing Co., Inc., P.O. Box 388, Westport, Connecticut 06880) (Fourth Edition, 1968) Price \$19; foreign \$20</p> <p>Reviewed by Norman E. Bednarczyk</p> <p>Food Technology <u>23</u>, No. 6, 40 (June 1969)</p> <p>The book contains comprehensive descriptions of the commercial production of frozen fresh foods, including information on fish and shellfish. Other chapters cover dehydrofreezing, freeze-drying, sanitation, statistical quality control, and food regulation and handling codes. [Abstracter: F. T. Piskur]</p> <p>[Abstracter: F. T. Piskur]</p> <p>This book is useful to those persons concerned with the manufacture and sale of frozen foods. It contains recipes and directions for preparing different types of frozen foods. It also contains discussions of the problems that can occur with a product and information on the solution of these problems. Other chapters deal with the chemical, physical, and microbiological problems unique to frozen precooked foods, and with the packaging and marketing of frozen foods.</p> <p>Reviewed by Norman E. Bednarczyk</p> <p>Food Technology <u>23</u>, No. 6, 40 (June 1969)</p> <p>The Freezing Preservation of Foods, Vol. 4. Freezing of Precooked and Prepared Foods, 569 pp. (Avi Publishing Co., P.O. Box 388, Westport, Connecticut 06880) (Fourth Edition, 1968) Price \$22; foreign \$23</p> <p>Reviewed by Norman E. Bednarczyk</p> <p>Food Technology <u>23</u>, No. 6, 40 (June 1969)</p> <p>THE FREEZING PRESERVATION OF FOODS VOL. 4. (Cross Ref.: 3.20) FREEZING OF PRECOOKED AND PREPARED FOODS</p> <p>Tressler, D. K., W. B. Van Arsdel, and M. J. Copley (eds.)</p> <p>The Freezing Preservation of Foods, Vol. 4. Freezing of Precooked and Prepared Foods, 569 pp. (Avi Publishing Co., P.O. Box 388, Westport, Connecticut 06880) (Fourth Edition, 1968) Price \$22; foreign \$23</p> <p>Reviewed by Norman E. Bednarczyk</p> <p>Food Technology <u>23</u>, No. 6, 40 (June 1969)</p> <p>REPORT OF THE BUREAU OF COMMERCIAL FISHERIES BIOLOGICAL LABORATORY, ST. PETERSBURG BEACH, FLORIDA, FISCAL YEAR 1968</p> <p>Sykes, James E. (Biological Laboratory, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, St. Petersburg, Florida)</p> <p>U.S. Fish and Wildlife Service, Circular 313, 25 pp. (May 1969)</p> <p>The major goals of the Laboratory are to explore the relatively unknown scope of biological productivity in the coastal zone of the eastern Gulf of Mexico, to measure the effect of changes in that zone, and to develop methods of increasing estuarine fishery resources. The report describes current research on projects in the Estuarine, Red-Tide, and Industrial Schoolfishes Programs. The projects include studies of sediments and organisms in bay bottoms, plankton crops and fishes residing in and transferring between estuaries and the Gulf of Mexico, toxicity of the red-tide organism, and experimental rearing of pompano in an impounded lagoon. A physical, hydrological, biological, and sedimentological inventory of Florida estuaries is also in progress as part of a cooperative effort with the National Oceanographic Data Center and the States of Alabama, Mississippi, and Louisiana. [19 figures, 8 tables, 19 cited publications]</p> <p>[Author's abstract]</p>
<p>7.615 DETERMINATION OF CAROTENES BY THIN-LAYER CHROMATOGRAPHY</p> <p>(Cross Ref.: 6.32)</p> <p>Hiyama, Tetsuo, Mitsuo Nishimura, and Britton Chance (Johnson Research Foundation, University of Pennsylvania, Philadelphia 19104)</p> <p>Analytical Biochemistry <u>29</u>, No. 2, 339-342 (May 1969)</p> <p>The paper reports a method for the separation of <math>\alpha</math>- and <math>\beta</math>-carotenes by thin-layer chromatography in which less than 1 <math>\mu</math>g. of the carotene is required for quantitative determination by spectroscopy. The carotene contents of several strains of the alga <i>Chlamydomonas reinhardtii</i> were measured by the method. [2 figures, 2 tables, 10 references]</p> <p>[Abstracter: F. T. Piskur]</p> <p>By use of a nondigestive procedure with sulfuric-periodic acid reagent, phospholipide phosphorus can be readily determined directly on the silica gel removed from thin-layer chromatograms. The procedure is specific for hydrolyzable phospholipide containing two acid-hydrolyzable groups. Carotolipin reacts only partially; sphingomyelin, diether lecithin, and phosphatidylcholine fail to react. [1 figure, 8 references]</p> <p>[Abstracter: F. T. Piskur]</p> <p>7.593 PHOSPHORUS DETERMINATION IN PHOSPHOLIPIDES FROM THIN-LAYER CHROMATOGRAMS</p> <p>Rosenthal, Arthur F., and Stella Ching-Hsien Han (Department of Laboratories, The Long Island Jewish Hospital, New Hyde Park, New York 11040)</p> <p>Journal of Lipids <u>10</u>, No. 2, 243-245 (March 1969)</p>	<p>9.4 THE FREEZING PRESERVATION OF FOODS VOL. 3. (Cross Ref.: 3.2) COMMERCIAL FREEZING OF FRESH FOODS</p> <p>Tressler, D. K., W. B. Van Arsdel, and M. J. Copley (eds.)</p> <p>The Freezing Preservation of Foods Vol. 3. Commercial Freezing of Fresh Foods, 486 pp. (The Avi Publishing Co., Inc., P.O. Box 388, Westport, Connecticut 06880) (Fourth Edition, 1968) Price \$19; foreign \$20</p> <p>Reviewed by Norman E. Bednarczyk</p> <p>Food Technology <u>23</u>, No. 6, 40 (June 1969)</p> <p>The book contains comprehensive descriptions of the commercial production of frozen fresh foods, including information on fish and shellfish. Other chapters cover dehydrofreezing, freeze-drying, sanitation, statistical quality control, and food regulation and handling codes. [Abstracter: F. T. Piskur]</p> <p>[Abstracter: F. T. Piskur]</p> <p>This book is useful to those persons concerned with the manufacture and sale of frozen foods. It contains recipes and directions for preparing different types of frozen foods. It also contains discussions of the problems that can occur with a product and information on the solution of these problems. Other chapters deal with the chemical, physical, and microbiological problems unique to frozen precooked foods, and with the packaging and marketing of frozen foods.</p> <p>Reviewed by Norman E. Bednarczyk</p> <p>Food Technology <u>23</u>, No. 6, 40 (June 1969)</p> <p>The Freezing Preservation of Foods, Vol. 4. Freezing of Precooked and Prepared Foods, 569 pp. (Avi Publishing Co., P.O. Box 388, Westport, Connecticut 06880) (Fourth Edition, 1968) Price \$22; foreign \$23</p> <p>Reviewed by Norman E. Bednarczyk</p> <p>Food Technology <u>23</u>, No. 6, 40 (June 1969)</p> <p>REPORT OF THE BUREAU OF COMMERCIAL FISHERIES BIOLOGICAL LABORATORY, ST. PETERSBURG BEACH, FLORIDA, FISCAL YEAR 1968</p> <p>Sykes, James E. (Biological Laboratory, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, St. Petersburg, Florida)</p> <p>U.S. Fish and Wildlife Service, Circular 313, 25 pp. (May 1969)</p> <p>The major goals of the Laboratory are to explore the relatively unknown scope of biological productivity in the coastal zone of the eastern Gulf of Mexico, to measure the effect of changes in that zone, and to develop methods of increasing estuarine fishery resources. The report describes current research on projects in the Estuarine, Red-Tide, and Industrial Schoolfishes Programs. The projects include studies of sediments and organisms in bay bottoms, plankton crops and fishes residing in and transferring between estuaries and the Gulf of Mexico, toxicity of the red-tide organism, and experimental rearing of pompano in an impounded lagoon. A physical, hydrological, biological, and sedimentological inventory of Florida estuaries is also in progress as part of a cooperative effort with the National Oceanographic Data Center and the States of Alabama, Mississippi, and Louisiana. [19 figures, 8 tables, 19 cited publications]</p> <p>[Author's abstract]</p>



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